AJN 6922

THE CONDITION OF INSTRUCTIONAL FACILITIES IN FLORIDA COMMUNITY COLLEGES

By

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A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL
OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF EDUCATION

UNIVERSITY OF FLORIDA
1992

To my father, Pedro Guarionex Lopez Rodriguez, who taught me love and appreciation for intellectual accomplishments; to Jasson, whose total commitment in the pursuit of his goals showed me that it was just a matter of persistence; to my mother and brothers who believed in me; to Dr. James L. Wattenbarger, Dr. Rachel B. Shireman and Dr. David S. Honeyman whose patience, support, and guidance made the completion of my studies possible.

ACKNOWLEDGEMENTS

I am very grateful to my chairman, Dr. David S. Honeyman, and my cochair, Dr. James L. Wattenbarger, for the privilege of working with them as well as their demonstration of unlimited patience. I am also indebted to the other members of my committee, Dr. Rachel B. Shireman and Prof. George Scheffer, for their patience and support.

I am also indebted to the support of others who indirectly contributed to the completion of this study: Mr. Ron Fahs, who made all the information I needed from the State Board of Community Colleges readily available to me; Ms. Christina Aslan whose help was greatly appreciated; and the City of Gainesville Community Development Graphics staff for bearing with me throughout the completion of this study.

Finally I acknowledge the understanding of my husband Jasson as well as other family members and friends who kept me focused enough to complete this study.

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Abstract of Dissertation Presented to the Graduate School
of the University of Florida in Partial Fulfillment of the
Requirements for the Degree of Doctor of Education

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By

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December, 1992

Chairperson: David S. Honeyman
Major Department: Educational Leadership

The purpose of this study was to measure the condition of Florida's community college instructional facilities and to determine the relationship between the condition of those facilities and budget allocations for capital outlay, maintenance and debt service. In addition, this study determined whether or not differences existed among the condition of those facilities and their levels of deferred maintenance when compared by size category of the college.

The population for this study was the 28 operating community colleges in Florida during the 1889-90 academic year. The community colleges were grouped according to their size category. A stratified random sample was drawn from this population. A survey instrument was developed in order to collect descriptive information about the buildings in the sample. One questionnaire per building in the sample was mailed to the officer in charge in each community college where the building was located.

A computed ratio, the Replacement Cost Index (RCI), was used to assess the condition of each instructional facility in the study. Stepwise regression analyses were run to determine the nature and the extent of the relationship between the condition of community college facilities and age of the facility, level of deferred maintenance, gross square footage of college, and percentages of various categories allocated for plant expenditures in Florida. Analyses of variance were run to determine if there were significant differences between the conditions of community college instructional facilities as measured by the RCI, including reported levels of deferred maintenance, when compared according to the size category of the college. Additional analyses of variance were used to test if significant differences existed between the RCIs, when compared according to reported adequacy and reported accessibility.

This was the first comprehensive and objective study of the condition of community college instructional facilities statewide. The relationship between the RCI versus age indicated rapidly deteriorating facilities and the need to monitor effect of deferred maintenance on the condition of educational facilities.

CHAPTER 1
DESCRIPTION OF THE STUDY

Introduction

There has been an increasing concern about the deteriorating conditions of American college and university campus facilities (Kaiser, 1984; Sasken, 1987; Rush & Johnson, 1989). Two common terms surfaced in the literature which described facilities problems, capital renewal and deferred maintenance. There has been considerable discussion about the technical meaning of these terms, but two general definitions existed. Capital renewal referred to a planned capital investment program which ensured that facilities would function at levels commensurate with the academic priorities and missions of an institution (Rush & Johnson, 1989). Deferred maintenance referred to the postponement of major maintenance required for existing facilities (Rush & Johnson, 1989). While Kaiser (1984) reported that the precursors to facilities needs for capital renewal were facilities age and poor quality construction, the precursor to deferred maintenance was limited resources.

The history of events related to the problems in the decade of the 1980s could be traced back to the period of growth in higher education initiated in the United States in the late 1940s. In 1945, the G.I. Bill was passed providing funds to returning World War II veterans who wanted to pursue higher education. Expenditures under this Bill resulted in extensive federal funding of university research and generated an increased demand for higher education. The "baby boom" of the decades of the 1950s and 1960s followed, bringing higher education into its "Golden Age" (Freeman & Holloman, 1975; Witmer, 1978).

The effect of an increased demand for higher education and availability of funds to support it was rapid construction of new college and university facilities. More college and university space was constructed between 1950 and 1975 than in the previous 200 years (Rush & Johnson, 1989). As Figure 1 shows, by 1990, one-third of higher education physical plants were at least 30 years old, and about two-thirds were 20 or more years old. These data indicated that by 1990 most of the college and university space had reached a significant age.

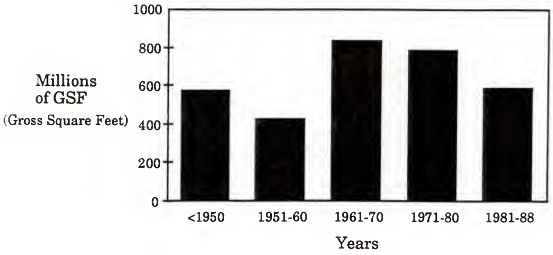


Figure 1. Growth of Space by Decade (Source: Rush & Johnson, 1989, p. 39).

Age and the poor quality of construction of existing educational facilities contributed to the hasty deterioration of such facilities and need for capital renewal. Many buildings constructed in the decade of the 1960s were hastily built to accommodate the rapid increase in student enrollment. Many institutions permitted the use of inferior quality materials in their new buildings in an attempt to use their available capital more expediently. As a result, facilities were functional in the near term, but not likely to hold up in the long term (Rush & Johnson, 1989).

The problem of deferred maintenance has been related to the financial condition of an institution. Kaiser (1984) indicated that in an era of fiscal constraints for higher education, financially strong institutions made major sacrifices to maintain the quality of their programs while weaker institutions were reducing staff, deferring compensation and eliminating programs. As a result, maintenance was deferred, renewal and replacement of academic, residential and support buildings ignored and purchases for replacement of technologically obsolete equipment postponed.

By 1991 higher education institutions had an impressive number of buildings and physical facilities. Many higher education facilities were reported as being in a condition of deterioration. Buildings that were inflexible and unable to support new initiatives (new programs) were considered obsolete. Many buildings were neglected (Turner, 1987) and underutilized (Milgrom & Sisam, 1987). In an era of fiscal constraints, when the construction of new facilities was limited, viable alternatives to new construction should have been considered. If deferring maintenance of buildings resulted in an increase in the need to replace older buildings, then monitoring the levels of deferred maintenance was critical.

One measure of adequacy that has been used to evaluate the condition of public school facilities is the Replacement Cost Index (RCI) (Honeyman & Stewart, 1985; Honeyman, Wood, Thompson, & Stewart, 1988; Burns, 1990). The RCI was developed in an attempt to address the issue of historic cost versus current replacement cost ratio analysis. Honeyman et al. (1988) defined the index as

> the ratio of the original cost of a building plus the sum of all major additions, renovations, and other capital improvements to the building divided by its estimated replacement cost.
> (p. 233)

It was theorized that a high value for the computed index for a building indicated that repair and renovation had maintained the value and condition of the structure over time and a low index indicated neglect or inability to fund maintenance or needed improvement. The RCI served to compare conditions of community college facilities among the districts within a state. By using the RCI the condition of the facilities could be related to capital outlay support mechanisms available to institutions of higher education.

The purpose of this study was to identify the condition of Florida's community college instructional facilities and to determine the relationship between the condition of those facilities and age of the facility, level of deferred maintenance, gross square footage of college, budget allocations for capital outlay, maintenance, and debt service. An additional purpose was to determine whether or not differences existed among the condition of those facilities and their levels of deferred maintenance according to the size of the institution.

Rationale for Selection of Unit of Study

Community college facilities account for 24% of the total college and university facility space in the United States (Rush & Johnson, 1989). This study focused on determining the condition and adequacy of community and junior college facilities in Florida. The condition of the facilities was determined by looking at the funding of the construction of such facilities as well as the allocation of resources for their maintenance.

An earlier study of community college funding mechanisms indicated that funds for capital outlay generally came from a single source (Garms, 1977). In a recent study Honeyman, Williamson, and Wattenbarger (1991) found that community colleges in most states derived the majority of capital outlay funds from state funds. The state of Florida was one of those states.

In 1991 Florida community colleges funds for plant operation and maintenance were derived from their educational and general expenditure budget. Budget allocations made by the State followed the cost-to-continue-plus negotiated method (Wattenbarger & Mercer, 1988). A base year was calculated by using cost analysis data and a three-year rolling average of enrollment. No assumptions for growth or decline were made. The "plus" portion of the budget was determined by the State Board of Community Colleges in conjunction negotiations with legislative representatives.

Monies allocated by the State specifically for new construction were known as Public Education Capital Outlay (PECO) (Department of Education, 1990). Criteria for distribution of these funds were based on demonstrated need and local surveys and prior approval. Other categories of funds that could be used for construction expenditures were Capital Outlay and Debt Service (CO & DS), Local, and Federal. In some cases Special legislative appropriations were made for rehabilitation of facilities (i.e. asbestos removal from buildings).

Statement of the Problem

The purpose of this study was to identify the condition of Florida's community college instructional facilities and to determine the relationship between the condition of those facilities and age of the facility, level of deferred maintenance, gross square footage of college, budget allocations for capital outlay, maintenance, and debt service. In addition, this study was used to determine whether or not differences existed among the condition of those facilities and their levels of deferred maintenance when compared according to the size category of the institution. The following research questions were posed:

1. Are there significant relationships between the condition of community college instructional facilities, as measured by the Replacement Cost Index (RCI) and age of the facility, level of deferred maintenance, gross square footage of college, and the percentages of various budget categories (i.e. PECO, CO & DS, and Local) allocated for plant expenditures in Florida?
2. Are there significant differences between the conditions of community college instructional facilities as measured by the RCI according to the size category of the institution?

3. Are there significant differences between the conditions of community college instructional facilities as measured by the RCI and reported levels of deferred maintenance according to the size of the institution?
4. Are there significant differences between the conditions of community college instructional facilities as measured by the RCI according to adequacy of the facility for current and future enrollment and accessibility to the facility in terms of complying with the Americans With Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Proposed Rule (Federal Register, 1991)?

Delimitations and Limitations

Delimitations

This research was limited to community and junior college facilities in Florida. Only those facilities classified as instructional were studied. The types of instructional facilities were identified and accounted for in the analysis of the data. The condition of administrative and support services facilities was not determined in this study. The data pertaining to state funding were collected from the State Department of Education, Division of Community Colleges. Information pertaining to facility adequacy and deferred maintenance was obtained by means of a survey instrument which was completed by individual officials in each selected community college.

Limitations

The results of this study may be generalized only to instructional facilities of community colleges within the state of Florida. Information regarding allocation of state funds was dependent on the accuracy of the records in the State Department of Education, Division of Community Colleges. Data obtained through the survey instrument were based on the knowledge, perceptions, and estimates made by individual officials in each community college. The conditions evaluated were those existing at the time the questionnaire was completed.

Significance of the Study

Several of the justifications for this study were rooted in the importance of designing and/or maintaining adequate facilities for the functioning of a community of learning, a college or university. Without campuses and facilities that are adequate it would be impossible to carry on the enterprise of higher education. Buildings and equipment provide the form that shapes the function (Boyer, 1989).

There are several reasons why the facilities of a campus should be carefully monitored and maintained. The facilities of a college are vitally important in the recruitment of its students (Boyer, 1989). During the Carnegie Foundation's recent study of collegiate education, 1,000 high school graduates who planned to attend college were surveyed. They were asked what they considered most important in their choice of college. Over 60% said that the appearance of the campus was most crucial. One good indication of the importance college administrators placed on how their facilities "looked" may be observed in the college catalogs. When catalogs of several colleges were examined to see how they present the college visually to prospective students, one could observe that pictures of aesthetically pleasing buildings and settings on campus were regularly included. Adequate facilities and well maintained campuses are consequential in attracting students as well as faculty.

Another important reason why the facilities of a campus should be carefully monitored, is the issue of maintenance. In technical terms, maintenance equates to capital resource management. Capital resources are the total of all land, buildings, campus infrastructure, non-expendable or capital equipment, any other fixed tangible assets, plus any capital funds available for altering existing capital resources or creating new ones. Capital resources management refers to the institutional function aimed at achieving the most effective and efficient use of an institution's capital resources for maximum benefit to all programs at the least possible cost (Griffith, 1984). From the management perspective, both "effective" and "efficient" are important terms. Effective facilities means that the facilities fit programs and enhance their operation. Efficiency refers to getting the most for the least amount of capital investment.

During the period of 1972 to 1984 it was reported that the share of funds budgeted for day-to-day operation and maintenance of the physical plant on most campuses increased from the 8 to 10% level to the 12 to 15% level, in spite of efforts to reduce costs (Griffith, 1984). Both escalation in energy cost as well as processes to alter capital resources were major contributors to such increase. In an era of reduced operating funds, higher education should focus on the cost equation in order to make the management of capital resources more efficient (Griffith, 1984).

Many campuses were presented with the challenges inherent in an aging physical plant that required modification to meet the changing requirements of academic programs. The deferred maintenance issue was an expense inherent in the natural evolutionary aging process of a facility as well as the functional obsolescence of existing space as academic programs shifted to meet the demands of new information and technology (Saksen, 1987).

Finally, the quality of education was linked to the quality of the facilities. Proper maintenance of buildings, supply of equipment, and keeping research laboratories in working order were part of the education process (Boyer, 1989). These actions would clearly ensure effective education.

The impact that adequate or inadequate quality of facilities has on the overall functioning of a college could be much greater than it seems on the surface. Attention must be directed to the condition of educational facilities as well as maintenance requirements. This study served to determine the existing condition of community college instructional facilities within the state of Florida and to identify the extent of neglect of those facilities. This study also evaluated the adequacy of the existing funding mechanisms.

Definition of Terms

Capital Outlay and Debt Service (CO & DS) were trust funds established by the State under article XII of the Florida Constitution with funds derived from a portion of fees collected for automobile license tags and distributed to school districts and community colleges to finance construction of school and community college facilities and to service debts incurred by them for construction of educational facilities (Bureau of Information Services, 1991).

Capital Renewal was a planned capital investment program which ensured that facilities would function at levels commensurate with the academic priorities and missions of an institution.

Community Colleges were public two-year colleges established to serve the citizens of the State of Florida by offering the first two years of a baccalaureate degree, vocational education, and adult continuing education. In some instances this type of institution was referred to as a Junior College (Department of Education, 1990).

Deferred Maintenance was the postponement of major maintenance expenses required for existing facilities. This was recorded in a total dollar amount per building from information obtained from the survey instrument.

Public Education Capital Outlay (PECO) were bonds sold only by the State under the provision of Article XII of the Florida Constitution for the purpose of financing the construction of higher education facilities. Projects using these funds must have been approved by statutes prior to construction. The bonds were retired from the proceeds of revenue derived from gross utility receipt tax (Bureau of Information Services, 1991).

Replacement Cost Index (RCI) was the measure of adequacy of a facility. It was described as the ratio of the original cost of a school facility plus the sum of all capital improvements made to that facility, divided by the estimated current replacement cost for the structure including all improvements that might be needed (Honeyman & Stewart, 1985).

Overview of the Methodology

The study began with a review of the relevant literature pertinent to financing Community Colleges facilities in the United States as well as funding mechanisms specific to the state of Florida. From this body of information those funding mechanisms for Florida were identified. Data were then obtained from the State Board of Education, Community College Division, Bureau of Information Systems and the community college facility offices pertinent to individual facility's condition, adequacy, and accessibility. An inventory of descriptive nature of Florida's Community College instructional facilities was constructed. All data were analyzed to determine the condition and adequacy of community college instructional facilities and whether differences existed between the condition of those facilities as measured by the RCI when compared by size category of the college.

Population

This investigation concentrated on studying the condition of community college facilities and the funding mechanism within one state only. This allowed comparisons to be made between the conditions of facilities and the mechanisms used to provide funds.

In a recent study (Honeyman, Williamson, & Wattenbarger, 1991), most states reported a majority of capital outlay funds for community colleges as being derived from various combinations of state taxes and bonds. The state of Florida was identified as one of those states that relied on state funds, derived from state taxes and bonds, for financing of their capital outlay. Members of the staff of the Florida State Board of Community Colleges as well as several representatives of individual Community Colleges expressed willingness to cooperate with this study. The Community College System of the State of Florida was therefore selected in order to carry out the purposes of this study.

In 1989, Rush and Johnson identified 96.6% of the total construction (in terms of square footage) of "Two-year" institutions as being educational and general. In this study facilities were classified in terms of instructional use. The two types of instructional facilities that were analyzed were those consisting of lecture rooms and laboratories .

Data Collection

The data were collected in the following manner:

1. The researcher obtained a copy of the Facilities Inventory Report from the Florida State Board of Community Colleges in order to construct a current inventory of all community college instructional facilities and their setting within the State.
2. The Facilities Director of the Bureau of Financial and Business Services, State Board of Community Colleges and an Accountant of the Office of Educational Facilities of the Florida Department of Education were contacted in order to obtain data on categorical budget allocations.

3. A survey instrument (Appendix A) was prepared and utilized to obtain information pertinent to the adequacy and accessibility of selected buildings.
4. Once the buildings were identified the community college Presidents' offices were contacted to obtain data that would enable computation of the RCI.

Data Analysis

The data were analyzed in three different stages:

In the first stage, the current condition of Florida's community college instructional facilities was determined via the computation of the RCI. Stepwise regression analyses were run to determine the nature and the extent of the relationship between the condition of community college facilities and age of the facility, level of deferred maintenance, gross square footage of college, and the percentages of various budget categories allocated for plant expenditures in Florida.

In the second stage, the data were analyzed to determine if there were significant differences between the conditions of the community college instructional facilities as measured by the RCI when compared according to the size category of the institution. Analyses of variance were run to determine if there were significant differences between the conditions of the facilities including reported levels of deferred maintenance when compared according to the size category of the institution.

In the third stage, data obtained from the survey were used to evaluate adequacy and accessibility of community college instructional facilities and levels of deferred maintenance.

Organization of the Study

Chapter I in this study includes the introduction, a statement of the problem, a justification of for the study, assumptions, delimitations, limitations, definition of terms, and overview of the methodology. Chapter II presents a review of the relevant literature about financing community college facilities, funding mechanisms within the state of Florida, and similar studies evaluating the condition of instructional facilities. Chapter III presents a detailed description of the methodology to be used. The analysis of data generated and relevant findings are analyzed and presented in Chapter IV. The results are summarized and recommendations are presented in Chapter V.

CHAPTER II
REVIEW OF RELATED LITERATURE

The following discussion is divided into four sections. The first section discusses studies related to the condition of educational facilities and a detailed explanation of the Replacement Cost Index. The second section presents Capital outlay funding mechanisms in the United States and in the State of Florida. The Florida community College System, definition, mission, and responsibilities, are presented in the third section. The condition of educational facilities in Florida is also discussed in the third section. Finally, the Americans With Disabilities Act (1990) is briefly discussed in the fourth section, including a description of its potential effect on community college operations.

Related Studies

In 1984 Kaiser concluded that the "halls of academe are crumbling." The campuses of higher education were in such a dilapidated condition that they endangered life and property. This was found to be the situation even in the most heavily endowed campuses which operated on a slim margin of tuition revenues and local government appropriation.

Kaiser (1984) identified capital renewal and replacement as the two major issues of concern to the higher education community. Recommendations for action included the following:

1) Selecting priorities for capital renewal and replacement. A priority ranking method is presented whereby projects are defined as being a) necessary, b) suitable for reduction in scope and cost, and c) deferrable.

2) Developing a method for the establishment of annual levels of funding. Common methods for defining annual funding levels for maintenance and capital renewal, such as Straight Line or Historical Budgeting, Formula Budgeting, and Survey of Needs, are identified as possessing one or more major deficiencies.

The Life-Cycle concept model (Haviland, 1978) is introduced for the analysis of annual levels of renewal and replacement funding. Several institutions are reported as having used this method. They recommend using a value of 1.5 to 3 percent of the total replacement value of the physical plant as being appropriate (Kaiser, 1984). The Life-Cycle model involves a component known as the replacement index. The computation of such index follows:

1) Identify all building systems (n).

2) Determine the cost per gross square ft. of each building system (csf).

3) Determine the percent of total construction cost of each building system (pcc).

$$(pcc) = \frac{(csf)}{\text{total cost per building gross sq. ft.}} * 100.$$

4) Determine the average number of years before replacement or repair of each building system (yrs).

$$\text{Replacement Index (RI) per system} = \frac{(pcc)}{(yrs)}.$$

$$\text{Replacement Index for building (TRI)} = \frac{\text{sum of all Replacement Index (RI) per system.}}{(n)}$$

Finally, the three sources of funding for capital outlay, annual operating budgets, external sources, and innovative techniques, are examined to suggest opportunities for generation of funds (Kaiser, 1984).

In 1989 Rush and Johnson completed a study whereby they reaffirmed Kaisers' earlier conclusions (1984). They reported that higher education faced two basic issues of capital renewal and replacement. Rush and Johnsons' study dated the need of capital outlay renewal and replacement back to 1974, when a survey was conducted by the National Center for Education Statistics (NCES). It indicated that 20% of all college and university space was in need of renewal, replacement or demolition. Rush and Johnson's study (1989) found that there was a "$20.5 billion priority portion of the overall problem". The definition of priority was defined as repairs and renovations which, if left undone, place facilities at risk. Twelve percent of the total priority needs were associated with two-year institutions. This translates to a total of $2.46 billion.

The capital renewal and replacement problem was not limited to facilities in higher education institutions. Many existing studies depict a similar or perhaps even worse picture of facilities belonging to school districts (Burns, 1989; Honeyman and Stewart, 1985; Honeyman, Wood, Thompson, & Stewart, 1988). Such studies establish the basis for lawsuits concerning equity. As a result, these studies concentrate on developing and implementing a systematic objective method to evaluate the condition of school facilities.

The Replacement Cost Index

The Replacement Cost Index (RCI) was a measure of adequacy developed to evaluate the condition of school facilities by Honeyman and Stewart (1985). The RCI attempted to address the issue of historic cost versus current replacement cost ratio analysis. All original and improvement costs were given in historic dollars while current replacement cost is the current dollar value of the facility. No correlation was evident between the age of the building and the RCI. The formula was given as follows (Honeyman, Wood, Thompson, & Stewart, 1988):

$$RCI = \frac{OC + \Sigma I_1 \ldots I_n}{CRC}$$

where OC = original cost,
I = the improvements from 1 to n,
CRC = the current replacement cost.

Honeyman and Stewart theorized that a high value (approaching 1) for the computed index for a building or group of buildings would indicate that the value of the structure had been maintained over time through repairs and renovations, while a low index would indicate neglect, inability to fund needed repair, maintenance, or needed improvement. By using the index they were able to make comparisons of the relative condition of facilities within a district as well as among school districts within a state.

In addition to deferred maintenance problems Honeyman and Stewart (1985) found that the need for facilities and maintenance resulted from constant changes imposed by different levels of government. Government mandates identified in their study pertained to asbestos abatement, access for the handicapped, and stringent safety and fire code compliance. Section 504 of the Rehabilitation Act of 1973 as well as Public Law 94-142 required that facilities be accessible for handicapped children (Smith, 1984).

In 1988 Honeyman et al. used the RCI to evaluate the condition of school facilities in small/rural districts in the United States. They found that the need for new construction and/or renovation is common throughout the nation. The researchers concluded that there is an "overwhelming inability" of local school districts to fund capital outlay at levels needed to keep their buildings adequate for current and projected student enrollment, safe according to the Occupational Safety and Health Administration (OSHA) requirements, and accessible to disabled populations. Evidence in this study suggested that school buildings were deteriorating rapidly and maintenance costs were rising. Since most states did not provide equalization aid for facility purposes, the cost of improvement and replacement of buildings generally fell to the local property tax mechanism.

Burns (1989) conducted a study which attempted to determine the relationship between the condition of school facilities in urban, suburban, and rural districts in New Jersey and budget allocations for capital outlay, maintenance and debt service. The Replacement Cost Index (RCI) was employed to measure the condition of the facilities. The results indicated that the amount of funding districts allocated for maintenance was directly related to the condition of their buildings. Statistically significant differences between the condition of school buildings and the type of district (urban, suburban, rural) were found when the reported levels of deferred maintenance were included in the analysis. Serious deferred maintenance needs were found in all school districts. It was evident that the current practices employed by the districts to fund capital outlay, maintenance, and debt service in New Jersey had contributed to the deteriorating condition of their school buildings.

Funding Capital Outlay

The allocation of funds for capital outlay for community colleges in the United States was reported as being almost exclusively financed by state and/or locality, with state contributions far outweighing local contributions (Garms, 1977; Honeyman, Williamson, & Wattenbarger, 1991; Wattenbarger & Mercer, 1988). In approximately 90% of the states capital outlay funds are derived exclusively from the state (Garms, 1977). Allocation of state funds was generally carried out according to "needs". This process seemed to appeal to many people, including members of the legislatures who served on powerful committees. The fact that members of the legislature were no longer trying to hide that political "special projects" did exist, could be considered a recent change in funding capital outlay (Wattenbarger & Mercer, 1988). The "special project" approach had become a most often used approach in funding capital outlay projects.

In Florida, monies allocated by the state for new construction were known as Public Education Capital Outlay (PECO). Criteria for the distribution of these funds was based on demonstrated need. A maintenance appropriation was also made from PECO funds. Such allocation was based on a percentage of the total monies available and the calculated need per college (Fixed Capital Outlay

Budget Request, 1990-91). In addition to Local and Federal funds, other category of funds used in new construction expenditure were Capital Outlay and Debt service (CO & DS). Special appropriations were made when major expenses were required for improvements, renovations, and/or maintenance (i.e. asbestos removal from buildings)(Castor, 1989).

Florida Community College System

Definition, Mission, and Responsibilities

State community colleges definition, mission and responsibilities were clearly stated in Florida Statutes, Chapters 228-246 (1990 edition). "State community colleges shall consist of all public educational institutions operated by community college district boards of trustees under statutory authority and rules of the State Board of Community Colleges" (Department of Education, 1990, pg. 330). A Community College could be authorized by the State Board of Education to operate a department designated as an area vocational education school or an adult high school. The primary mission and responsibility of the community colleges was to respond to community needs of postsecondary academic and vocational education. A community college should provide the first two years of undergraduate instruction and award associate degrees. The offering of community educational services which were not directly related to academic or occupational advancement, adult precollege education, and recreational and leisure services were considered a separate and secondary role to the community colleges. Postsecondary academic and vocational education programs had first priority in funding. Florida Statutes (1990) indicated that the terms "community college" and "junior college" could be used interchangeably.

The Planning and Construction of Florida Community College Facilities

The planning and construction of a community college facility could be initiated only following the establishment of a need for such facility. Such need should be established by a survey pursuant to Florida Statutes, Chapter 235 (Department of Education, 1990). The facilities recommended by such survey should be approved by the State Board of Education. The construction of the projects should follow the provisions of chapter 235 and State Board of Education rules.

A community college could expend public funds for the acquisition of additional property only with specific approval of the Legislature. If a community college acquired or constructed a facility that required general revenue funds for operation or maintenance upon the project completion or in the subsequent years of operation, it should have received prior approval from the Legislature.

The allocation of funds for facility renovation, remodeling, maintenance, repairs and site improvement needs was to be given priority consideration by the Legislature for appropriations from the total amount of the Public Education Capital Outlay and Debt Service Trust Fund appropriated. These funds were calculated according to the following formula (i.e. also known as the "sum of digits calculation"):

> the building value times the building age over the sum of the years' digits assuming a 50-year building life. For relocatable facilities a 20-year life shall be used. "Building value" is calculated by multiplying each

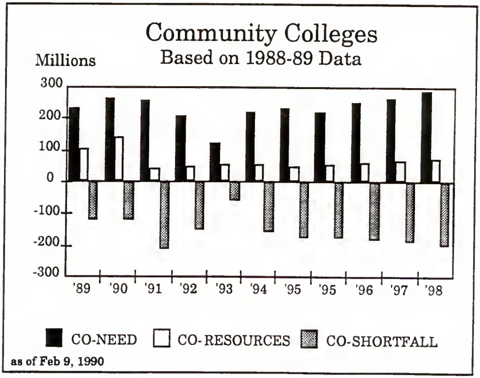
> building's total assignable square feet times the appropriate net-to-gross conversion rate found in state board rules and that product times the current average new construction cost. "Building age" is calculated by multiplying the prior year's building age times 1 minus the prior year's sum received from this subsection divided by the prior year's building value. (p. 234)

The Condition of Educational Facilities In Florida

In February, 1989, the Commissioner of Education for the State of Florida appointed the Facilities Task Force to evaluate the overall educational facility needs in the State and to make recommendations to meet the needs. The Facilities Task Force made recommendations to the Commissioner of Education regarding alternatives for meeting public education capital outlay needs until the year 2000. A report was submitted to the Commissioner on February 27, 1990 (Facilities Task Force, 1990). The issues that were discussed are indicative of the existing condition of the overall educational facility needs for the State. Three of those issues pertaining to community college facilities will be discussed in the following paragraphs.

The Task Force indicated that one issue that surfaced as a concern was the decline in quality of construction throughout Florida, evident in both private and public sector. Even though they considered that this issue was outside of the purview of their assigned task the members of the Task Force recommended that a committee be appointed to study this issue and make appropriate recommendations to correct current construction deficiencies.

A second issue of major significance was the trend in State funding of capital outlay projects has been declining in proportion to the need. Funding of construction projects for community colleges was totally dependent on state sources since they did not have taxing authority (unlike public school districts). As a result, community colleges had substantial unmet construction needs. The following chart (Figure 2) shows the capital outlay needs for the Community Colleges, the anticipated resources and the projected annual shortfall, for the years 1989-90 through 1998-99. The projected average annual shortfall for the years 1989-90 through 1993-94 was 465.7 million dollars, while the projected average annual shortfall for the years 1994-95 through 1998-99 is 493.0 million dollars (Facilities Task Force, 1990). These data indicate a slight but steady increase in the shortfall of resources available for capital outlay over the ten year period. The projected ten-year total shortfall was 4.79 billion dollars.



as of Feb 9, 1990

Figure 2. Capital Outlay Needs, Anticipated Resources and Projected Annual Shortfall (Source: Facilities Task Force, 1990, p. 17).

Finally, the Facilities Task Force brought up the issue of aging of the buildings and educational facilities that would continue to increase as time went by. They reported that 25% of all existing educational facilities in 1989 would have reached 50 years of age or more by the year 2007. The Capital Outlay and Debt Service (CO & DS) Trust Fund was originally established so that districts, community colleges and universities could establish sinking funds to meet the needs of long-range replacement plans. However, cost escalation over the years had diminished this fund source (Facilities Task Force, 1990). In light of the existing need for a facility replacement fund the Facilities Task Force strongly recommended that proceeds of CO & DS be used to establish such fund and supplement it with additional funds so that it would have the current purchasing power as it did when it was established.

The Americans With Disabilities Act

The Americans With Disabilities Act (ADA) (Pub. L. No. 101-336, 42 U.S.C. 12101, 1990) was passed by Congress in response to findings that 43 million Americans had one or more physical or mental disabilities, and that individuals with disabilities encountered various forms of discrimination, effects of architectural, transportation, and communication barriers and failure to make modifications to existing facilities, and that no legal recourse existed to redress such discrimination (Section 2 (a)). The most important element of the ADA over the Section 504 of the Rehabilitation Act of 1973 was that it extended coverage to include not only the public and private recipients of federal financial assistance, but the private sector as well. Covered entities under the Act were required to provide "reasonable accommodation" (Section 101 (9)). Reasonable accommodation could include making facilities readily accessible to and usable by individuals with disabilities and/or job restructuring, part-time or modified work schedules, reassignment to a vacant position and other similar accommodations for individuals with disabilities. The reasonable accommodation burden expected from the covered entity was balanced by the determination as to whether an accommodation would impose "undue hardship".

The ADA gave authority for issuing specific facility accessibility standards to the Architectural and Barriers Compliance Board. The Board issued proposed guidelines for compliance with ADA in January, 1991 (36 CFR Part 1191). The proposed guidelines use the ANSI A 117.1 format and numbering system (American National Standard Institute Inc., 1961, 1986).

The enforcement of the ADA provided remedies and procedures set forth in section 204(a) of the Civil Rights Act of 1964 (42 U.S.C. 2000a-3(a)). Aggrieved parties could file a complaint with the Attorney General who would investigate alleged violations. If the Attorney General had reasonable cause to believe a violation had occurred he/she could commence a civil action on behalf of the aggrieved parties. In a civil action the court could grant equitable relief that such court considered to be appropriate, award monetary damages to persons aggrieved when requested by the Attorney General, and assess a civil penalty against the entity.

Community Colleges and the ADA

The ADA requirements became effective on July 26, 1992 for employers with 25 or more employees. The ADA had major implications on the Community College System in the State of Florida. Such implications were of both legal and financial nature. The legal liability involved providing accessibility to and use of community college facilities. The financial implications could result in a large demand of funds imposed on the community colleges facilities budget allocations in making the design of facilities comply. Even though the ADA did not require an institutional self-study, such a study could serve as the first step towards preparation for compliance with the ADA.

Summary

The studies reviewed in this chapter indicated that educational buildings within United States were deteriorating. This was true of buildings within K-12 schools as well as in higher education institutions. The existing condition of buildings was linked to initial funding of the facilities and whether maintenance expenditures were made or deferred throughout the years.

The Replacement Cost Index was developed to evaluate the condition of school facilities. A high value for the computed index for a building indicated that the value of the structure had been maintained over time through repairs and renovations while a low index indicated neglect, inability to fund needed repair, maintenance or needed improvement. The Replacement Cost Index was used to make comparisons of the relative condition of facilities within a district as well as among school districts within a state.

In the United States, allocation of funds for capital outlay for community colleges was reported as being almost exclusively financed by state contributions. In Florida, monies were allocated for new construction and maintenance expenses for community colleges under PECO and CO & DS budget categories. Funds for new construction were allocated on the basis of demonstrated need. Funds for facility renovation, remodeling, maintenance, repairs and site improvements were calculated according to the "sum of digits calculation".

The condition of educational facilities in Florida was an issue of concern to the Department of Education. In February 1989 the Facilities Task Force was appointed to evaluate the overall educational facility needs in the State and to make recommendations to meet the needs. The Task Force reported a decline in quality of construction throughout the State, a declining trend in State funding of capital outlay projects for community colleges in proportion to need, and aging of the educational facilities as issues of major concern.

The Americans With Disabilities Act was passed in 1990. The ADA required that entities under Act made their facilities readily accessible to and useable by individuals with disabilities. The ADA had implications of legal and financial nature on the Community College System in Florida.

CHAPTER III
METHODOLOGY

This chapter contains a description of the procedures that were used in this study. The subsections are population and sample, instrumentation, data collection, and data analysis.

Population and Sample

The population for this study was the 28 operating community colleges in Florida during the 1989-90 academic year (Bureau of Information Services, 1990). A stratified random sample was drawn from this population for use in this study.

The 28 community colleges were classified according to their size. The size criteria was established by grouping the 28 community colleges into three categories. Each category accounted for 33% ± 10% of the 28 community colleges. The total headcount enrollment per college reported for fall of 1989-90 was then taken into consideration (Bureau of Information Services, 1990, p. 9). The range of variation of the total headcount enrollment per group was set as follows: 0 to 5,000 for the small, 5,000 to 15,000 for the medium, and over 15,000 for the large category. Following these criteria it was found that there were 8 small, 13 medium, and 7 large community colleges.

Only instructional facilities were considered in this study. A building was considered an instructional facility when it contained student stations (Bureau of

Information Services, 1991) and when total student stations' square footage accounted for 10% or more of the gross square footage of the building.

Only permanent facilities under sole ownership and use of the colleges themselves were taken into consideration is this study. In other words, this study did not include temporary, leased, and joint use buildings.

A total of 353 buildings comprised the entire population of instructional facilities for Florida community colleges (document). The 353 buildings were grouped into three categories based on the size (i.e. small, medium, large) of the community college where the building was found. The groupings are shown in Table 3-1.

The target sample population was 30% (i.e. 105 buildings) of the total population (353 buildings). This percent was chosen in order to ensure a high validity in representing the total population in the event of a poor response rate. The stratified random sample contained 105 buildings (35 buildings per category) in 28 Community Colleges. A predetermined quota of 35 buildings was drawn at random from each of the categories--small, medium, and large. For the small college category every second building was chosen; for medium and large college categories every fourth building was chosen.

Instrumentation

Information pertaining to funding of the colleges was obtained through literature provided by the Board of Education, Division of Community Colleges. Information pertaining to the building sample was obtained via survey. The form

Table 3-1

Grouping of Community Colleges and Buildings in Sample

Size	Community College Name	Total Enrollment Headcount	Number of Instructional Buildings	
SMALL	CHIP	2812	10	
	FKEY	2269	4	
	LCTY	2825	18	
	LSUM	2285	5	Total number of instructional buildings in small category = 71
	NFLA	819	7	
	PASC	4841	8	
	STJO	2937	8	
	SFLA	1452	11	
MEDIUM	BREV	13730	13	
	CFLA	5068	13	
	DAYT	10250	20	
	EDIS	8144	5	
	GULF	5644	8	
	INDR	13164	14	
	MANA	8547	14	
	OKAL	6682	10	
	PENS	10889	17	Total number of instructional buildings in medium category = 149
	POLK	5995	5	
	SANF	10512	13	
	SEMI	7661	9	
	TALL	8143	8	
LARGE	BROW	22842	24	
	FJAX	18725	23	
	HILL	17610	10	
	MIAM	46431	22	Total number of instructional buildings in large category = 135
	PALM	15417	23	
	STPE	19271	19	
	VALE	17646	12	
TOTAL			353 x .3 (30%) = 105.9	

(Appendix A) was adapted from studies by Honeyman, Wood, Thompson, and Stewart (1988) and Burns (1990). The questionnaire was validated as a survey instrument in those studies.

The questionnaire form used in this study was reviewed by an expert panel with recognized experience in the field of higher education administration, education facilities and finance. Recommendations for revisions from the reviewers were incorporated into the final form before it was mailed to the sample identified for this study.

The data collected with the questionnaire included descriptive information about the buildings in the sample. The building data included:

1. Cost of original construction;
2. Cost of major capital improvements to the building;
3. Adequacy of the building for current enrollment;
4. Accessibility to the building in terms of: adequate routes to disabled accessible entrances, disabled accessible entrances, and disabled accessible restroom(s); and
5. Estimated dollar amount of deferred maintenance and replacement cost of the building.

Data Collection

The questionnaire was mailed to the director of the facilities management office or his equivalent in each community college in charge of the buildings in the sample. The mailings included a cover letter, addressed by name to each official, explaining the purpose of the questionnaire and a self-addressed, stamped envelope for the return response. All officials were contacted by telephone prior to the mailings.

Data Analysis

The following research questions were posed in this study:

1. Are there significant relationships between the conditions of community college instructional facilities, as measured by the Replacement Cost Index (RCI) and age of the facility, level of deferred maintenance, gross square footage of college, and the percentages of various budget categories (i.e. PECO, CO & DS, and Local) allocated for plant expenditures in Florida?
2. Are there significant differences between the conditions of community college instructional facilities as measured by the RCI when compared by size category of the college?
3. Are there significant differences between the conditions of community college instructional facilities as measured by the RCI and reported levels of deferred maintenance when compared by size category of the college?
4. Are there significant differences between the conditions of community college instructional facilities as measured by the RCI when compared by adequacy of the facility for current and future enrollment and accessibility to the facility in terms of complying with the Americans With Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Proposed Rule (Federal Register, 1991)?

In order to test the research questions, four null Hypotheses were developed. Each null was tested independently with a 0.05 level of significance.

Null Hypotheses

Ho1 - There are no statistically significant relationships between the condition of community college instructional facilities, as measured by the Replacement Cost Index (RCI) and age of the facility, level of deferred maintenance, gross square footage of college, and the percentages of various budget categories (i.e. PECO, CO & DS, and Local) allocated for plant expenditures in Florida.

Ho2 - There are no significant differences between the conditions of community college instructional facilities as measured by the RCI when compared by size category of the college.

Ho3 - There are no significant differences between the conditions of community college instructional facilities as measured by the RCI and reported levels of deferred maintenance when compared by the size category of the college.

Ho4 - There are no significant differences between the conditions of community college instructional facilities as measured by the RCI when compared by adequacy of the facility for current and future enrollment and accessibility to the facility in terms of complying with the federal Accessibility Guidelines for Buildings and Facilities; Proposed Rule ADA (1990).

Method of Analysis

All data obtained was recorded in spreadsheet using Symphony software on a IBM XT compatible system (8088 processor). The format of these data was converted to enable the computing of the statistical analyses on a MacIntosh computer. The statistical program used for such computations was Statview version 1.01.

Null Hypothesis One dealt with the relationship between the condition of community college instructional facilities as measured by the Replacement Cost Index (RCI) and age of the facility, level of deferred maintenance, gross square footage of college, and the percentages of the various budget categories allocated for plant expenditures in Florida. The percentages of the various state budget allocations for maintenance, capital outlay and debt service were computed for each college in the sample. The RCI was computed for each building in the sample. A stepwise regression analysis was applied using the RCI as the dependent variable. The percentages of the various state budget allocations for maintenance, capital outlay and debt service, building age, original cost of building, and deferred maintenance were entered as independent variables. In this analysis tests are performed at each step to determine the contribution of each variable already in the equation if it were to enter last (Kerlinger & Pedhazur, 1973). A second stepwise regression analysis was applied using the Replacement Cost Index with deferred maintenance (RCI2) as the dependent variable. The stepwise regression analysis selected to test this null hypothesis because the variables were continuous (Huck, Cormier, & Bounds, 1974). At each step of the analysis various calculations were performed. These were the regression equation, partial correlations, the regression and residual sums of squares, and the F ratios.

Null Hypothesis Two dealt with the differences between the conditions of community college instructional facilities as measured by the RCI and the size of the community college where the building was found. An analysis of variance was used to test if significant differences existed between the RCIs according to the size category of the community college. An ANOVA test was chosen to test this hypothesis because it enabled the comparison of three groups (i.e. small, medium, large) simultaneously.

Null Hypothesis Three dealt with the differences between the conditions of community college instructional facilities as measured by the RCI and reported levels of deferred maintenance for each building and the size of the community college. An analysis of variance was applied to test if significant differences existed between the RCIs including reported levels of deferred maintenance according to the size category of the college.

Null Hypothesis Four dealt with differences between the conditions of community college instructional facilities as measured by the RCI when compared by reported adequacy for enrollment and accessibility taken separately. The adequacy and accessibility responses were reported in a YES - NO format. Analyses of variance (ANOVAs) were used to test if significant differences existed between the RCIs when compared by reported adequacy and reported accessibility.

Summary

The population for this study was the 28 operating community colleges in Florida during the 1889-90 academic year. The community colleges were grouped according to their size category. A stratified random sample was drawn from this population. Information pertaining to funding of community college facilities and budget allocations was drawn from literature provided by the Board of Education.

A survey instrument was developed in order to collect descriptive information about the buildings in the sample. One questionnaire per building in the sample was mailed to the officer in charge in each community college where the building was located. Four null hypotheses were developed to test the research questions. Parametric statistical analyses were used to test each null hypothesis. The first hypothesis was tested by running a stepwise regression analysis. In order to test the remaining three hypotheses analyses of variance were used.

CHAPTER 4
ANALYSIS OF DATA

The purpose of this study was to identify the condition of Florida's community college instructional facilities and to determine the relationship between the condition of those facilities and age of the facility, level of deferred maintenance, gross square footage of college, and budget allocations for capital outlay, maintenance, and debt service. In addition, this study determined whether or not differences existed among the condition of those facilities and their levels of deferred maintenance when compared by the size category of the college.

Descriptive profiles of Florida Community Colleges are presented in the first section of this chapter. The results of the statistical analyses performed to test each of the null hypotheses are presented in section two. Summary data tables are used to describe these findings.

Descriptive Profiles of Florida Community Colleges

The target sample population was 105 buildings located within the 28 community colleges in Florida. The community college officials returned the questionnaire on a total of 78 buildings. Twenty five of the buildings were in the small category, 27 were in the medium category and 26 were in the large category. This accounted for a 74% response rate. Twenty of the 28 community colleges in Florida were included in the sample.

Table 4-1

Descriptive Profiles of Florida Community College Facility Funding

Description	N (number)	Mean	Standard Deviation
Percent of General Fund allocated for Plant Operation and Maintenance 1989-90			
Statewide	78	12.1%	8.2
Small	25	11.0%	2.0
Medium	27	15.0%	3.0
Large	26	10.0%	2.0
Capital Outlay			
Statewide	78	$366,010.05	270,618.90
Small	25	$ 92,496.00	31,481.52
Medium	27	$328,653.04	119,278.33
Large	26	$667,798.15	196,922.43
PECO (Public Education Capital Outlay)			
Statewide	78	$179,274.00	115,127.00
Small	25	$ 76,705.20	19,150.00
Medium	27	$157,200.37	79,452.58
Large	26	$300,820.46	86,571.62

Table 4-1 lists the n (number), mean and standard deviation for each variable related to funding in Florida's Community College System. The variables related to funding were percent of the general fund allocated for plant operation and maintenance by community college, state allocation of Capital Outlay funds, and state allocation of PECO funds.

The mean value for the percent of the general fund allocated for plant operation and maintenance by community college statewide was 12.1%. The mean values of the percent of the general fund allocated for plant operation and maintenance for community colleges according to size the category ranged from 10.0% to 15.0%. The mean value for state allocations of capital outlay funds statewide was $366,010.05. The mean values for state allocations of capital outlay funds to community colleges according to size the category ranged from $92,496.00 to $667,798.15. The mean value for state allocations of PECO funds statewide was $179,274.00. The mean values for state allocations of PECO funds to community colleges according to size the category ranged from $76,705.20 to $300,820.46.

Table 4-2 lists the n, mean, and standard deviation for each variable related to the buildings. The variables related to the buildings were age of the building in years; cost of original construction; current replacement cost; and estimated dollar amount of deferred maintenance.

The mean value for the age of the buildings in the sample was 18.59 years. The mean values for age of the buildings according to the size category were small = 21.08, medium = 17.56, and large = 17.27. The mean value for cost of

Table 4.2

Descriptive Profiles of Florida Community College Instructional Facilities

Description	N	Mean	Standard Deviation
Age of Building (years)			
Statewide	78	18.59	8.62
Small	25	21.08	9.06
Medium	27	17.56	7.57
Large	26	17.27	9.03
Cost of Original Construction			
Statewide	78	$1,138,787.30	1,254,048.70
Small	25	$ 627,480.11	975,429.98
Medium	27	$1,129,184.89	1,033,020.32
Large	26	$1,640,400.58	1,515,681.04
Current Replacement Cost			
Statewide	78	$2,535,692.18	2,047,753.48
Small	25	$1,441,511.60	1,616,135.29
Medium	27	$3,023,405.89	2,094,938.65
Large	26	$3,081,314.08	2,019,871.41

Table 4.2 --continued

Description	N	Mean	Standard Deviation
Deferred Maintenance (current dollars)			
Statewide	78	$239,269.53	337,526.61
Small	25	$151,991.24	184,843.84
Medium	27	$290,739.41	432,471.83
Large	26	$269,741.46	334,856.08

original construction per building statewide was $1,138,787.30. The mean values for cost of original construction per building within the different groups ranged from $627,480.11 to $1,640,400. The average current replacement cost value per building statewide was $2,535,692.18. Mean values for the different groups were: small = $1,441,511.60, medium = $3,023,405.89, and large = $3,081,314.08. The mean value for deferred maintenance costs statewide was $239,269.53. The mean values for deferred maintenance costs per building within the different groups ranged from $151,991.24 to $290,739.41.

Table 4-3 presents the n, mean, and standard deviation for the computed measures assessing the condition of instructional facilities in the sample. All values are listed statewide and according to the size category. The descriptive statistics for the entire data set are presented in appendix C.

The mean value for the Replacement Cost Index (RCI) statewide was 0.54. The mean values for the RCI according to the size category were: small = 0.55, medium = 0.52, and large = 0.57. Furthermore, the mean value for the Replacement Cost Index with Deferred Maintenance (RCI2) statewide was 0.67. The mean values for the RCI2 according to the size category were: small = 0.70, medium = 0.64, and large = 0.68.

Table 4-3

Condition of Florida Community College Instructional Facilities

Description	N	Mean	Standard Deviation
Replacement Cost Index (RCI)			
Statewide	78	0.54	0.23
Small	25	0.55	0.23
Medium	27	0.52	0.24
Large	26	0.57	0.23
Replacement Cost Index with Deferred Maintenance (RCI2)			
Statewide	78	0.67	0.25
Small	25	0.70	0.26
Medium	27	0.64	0.24
Large	26	0.68	0.24

Results of Tests of Null Hypotheses

This study addressed four research questions (pg. 6, Chapter 1). Four null hypotheses were developed in order to test the research questions. A statement of what was addressed by each research question, its corresponding null hypothesis and an explanation of the results to the statistical analyses performed, will follow.

The first question addressed the relationship between the condition of community college instructional facilities and age of the facility, level of deferred maintenance, gross square footage of college, and the percentages of the various budget categories allocated for plant expenditures. The null hypothesis developed to test the first question was:

Ho1 - There are no statistically significant relationships between the condition of community college instructional facilities, as measured by the Replacement Cost Index (RCI) and age of the facility, level of deferred maintenance, gross square footage of college, and the percentages of various budget categories (i.e. PECO. CO & DS, and Local) allocated for plant expenditures in Florida.

In order to test the first hypothesis stepwise regression analyses were used. The first stepwise regression analysis determined how much of the variance of the RCI was explained by the different independent variables entered into the equation. The Current Age (CURAGE) of buildings, dollar value of Deferred Maintenance (DEFMAIN), Gross Square Footage (GSF) per college, PECO, Capital Outlay (CO), and Percent of general Fund (PercentF) were entered as independent variables. The partial correlation coefficients were used to test the strength and direction of the relationships between the dependent variable and each independent variable. A second stepwise regression analysis was applied using the Replacement Cost Index with deferred maintenance as the dependent variable.

The results of the first stepwise regression analysis are presented in Table 4-4. It was found that 35% of the variance for the RCI was explained by the current age of the building, gross square footage, allocation of PECO funds, allocation of funds for capital outlay, and the percent of the general fund spent for plant operation and maintenance. This was significant at the 0.05 level. When looking at the individual partial correlations only 4 of the 6 independent variables where found to make significant contributions to the regression analysis. No significant contribution to the regression analysis was made by gross square footage or the allocation of funds for capital outlay. The partial correlation between the current age of the building and the condition of instructional facilities statewide was significant, $r = -0.49$. The coefficient of determination (r^2) for the first step was 0.23, which indicated that the significant statistic explained 23% of the variance between the statewide RCI and the current age. This negative correlation indicated that an inverse relationship existed between the condition of the building and its current age. The older the building (greater number of years for current age) a corresponding lower value for the RCI (approaching zero) could be expected. As mentioned before, a low value of the RCI was indicative of neglect and poor maintenance of a facility. In brief, the older the building the poorer the condition it would be expected to be in.

Table 4.4

Stepwise Regression #1

Stepwise Regression Y_1 :RCI 6 X variables

Step No. 1 Variable Entered: X_1 : CURAGE

R:	R-squared:	Adj. R-squared:	RMS Residual
.48	.23	.22	.2

Variables in Equation

Variable:	Coefficient:	Std. Err.:	Std. Coeff.:	F to Remove
Intercept	.78			
CURAGE	-0.01	2.68E-3	-.48	22.69

Step No. 2 Variable Entered: X_2 : DEFMAIN

R:	R-squared:	Adj. R-squared:	RMS Residual
.51	.26	.24	.2

Variables in Equation

Variable:	Coefficient:	Std. Err.:	Std. Coeff.:	F to Remove
Intercept	.79			
CURAGE	-0.01	2.74E-3	-.43	17.63
DEFMAIN	-1.23E-7	6.99E-8	-.18	3.11

Step No. 3 Variable Entered: X_3 : GSF

R:	R-squared:	Adj. R-squared:	RMS Residual
.53	.28	.25	.2

Variables in Equation

Variable:	Coefficient:	Std. Err.:	Std. Coeff.:	F to Remove
Intercept	.85			
CURAGE	-0.01	2.78E-3	-.46	19.58
DEFMAIN	-1.18E-7	6.95E-8	-.17	2.87
GSF	-6.99E-8	4.96E-8	-.14	1.98

Table 4.4 --continued

Stepwise Regression Y_1 :RCI 6 X variables

Step No. 4 Variable Entered: X_4 : PECO

R:	R-squared:	Adj. R-squared:	RMS Residual
.55	.3	.26	.2

Variables in Equation

Variable:	Coefficient:	Std. Err.:	Std. Coeff.:	F to Remove
Intercept	.85			
CURAGE	-0.01	2.80E-3	-.49	21.77
DEFMAIN	-1.18E-7	6.90E-8	-.17	2.95
GSF	-1.93E-8	9.54E-8	-.39	4.07

Step No. 5 Variable Entered: X_5 : CO

R:	R-squared:	Adj. R-squared:	RMS Residual
.55	.3	.25	.2

Variables in Equation

Variable:	Coefficient:	Std. Err.:	Std. Coeff.:	F to Remove
Intercept	.85			
CURAGE	-0.01	2.88E-3	-.49	20.09
DEFMAIN	-1.22E-7	7.04E-8	-.18	3.01
GSF	-2.50E-7	2.09E-7	-.51	1.43
PECO	5.62E-7	3.82E-7	.28	2.16
CO	1.07E-7	3.43E-7	.13	.1

(Last Step) Step No. 6 Variable Entered: X_6 : PercentF

R:	R-squared:	Adj. R-squared:	RMS Residual
.59	.35	.29	.19

Table 4.4 --continued

Stepwise Regression Y_1 :RCI 6 X variables

Step No. 6 --continued

Variables in Equation

Variable:	Coefficient:	Std. Err.:	Std. Coeff.:	F to Remove
Intercept	.76			
CURAGE	-0.01	2.80E-3	-.49	21.82 **
DEFMAIN	-1.04E-7	6.89E-8	-.15	2.28 *
GSF	-2.93E-7	2.04E-7	-.6	2.07
PECO	6.61E-7	3.74E-7	.33	3.12 **
CO	1.61E-7	3.34E-7	.19	.23
PercentF	.62	.27	.22	5.19 **

* $p < .05$
** $p < .01$

A second significant relationship was found between the condition of the buildings and deferred maintenance. The significant statistic $r = -0.15$ was found to explain an additional 3% of the variance in the regression analysis. This negative coefficient indicated an inverse nature in the relationship between the RCI and deferred maintenance. To a greater estimated dollar value of deferred maintenance for a facility a lower corresponding value for the RCI could be expected. The greater the dollar amount of deferred maintenance the poorer the condition of the facility.

The relationship between allocation of PECO funds and the condition of the instructional facilities was found to be significant at the 0.05 level. The significant statistic $r = 0.33$ indicated a direct relationship between PECO fund allocations and the condition of the buildings. The greater the amount of PECO funds allocation per community college the higher the value for the corresponding RCI (approaching one) would be expected. This would indicate that the greater the amount of PECO funds allocations per community college the better the expected condition of its facilities.

The fourth significant relationship in this analysis was that between the condition of the building and the percent of general fund spent on plant operations and maintenance. The significant statistic $r = 0.22$ indicated the direct nature of the relationship. When a greater percent of the general fund spent on plant operations and maintenance in a community college a higher value for the RCI was found. A high RCI (approaching 1) indicated good condition of a building. This coefficient contributed an additional 5% explanation of the variance to the regression analysis.

The results to the second stepwise regression analysis are reported in Table 4.5. In this analysis the Replacement Cost Index with deferred maintenance (RCI2) was entered as the dependent variable to study the effect of deferred maintenance on the relationship between the condition of community college instructional facilities and age of the facility, gross square footage of college, and the percentages of the various budget categories allocated for plant expenditures. The Gross Square Footage (GSF) per college, PECO allocations, Capital Outlay (CO), Percent of general Fund (PercentF) and Current Age (CURAGE) of buildings were entered as independent variables. The partial correlation coefficients were used to test the strength and direction of the relationships between the dependent variable and each independent variable.

Table 4.5

Stepwise Regression #2

Stepwise Regression Y_1 :RCI2 5 X variables

Step No. 1 Variable Entered: X_1 : GSF

R:	R-squared:	Adj. R-squared:	RMS Residual
.16	.03	.01	.24

Variables in Equation

Variable:	Coefficient:	Std. Err.:	Std. Coeff.:	F to Remove
Intercept	.73			
GSF	-8.33E-8	25.96E-8	-.16	1.95

Step No. 2 Variable Entered: X_2 : PECO

R:	R-squared:	Adj. R-squared:	RMS Residual
.21	.04	.02	.24

Variables in Equation

Variable:	Coefficient:	Std. Err.:	Std. Coeff.:	F to Remove
Intercept	.71			
GSF	-2.03E-7	1.13E-7	-.39	3.22
PECO	5.70E-7	4.58E-7	.27	1.54

Step No. 3 Variable Entered: X_3 : CO

R:	R-squared:	Adj. R-squared:	RMS Residual
.22	.05	.01	.24

Variables in Equation

Variable:	Coefficient:	Std. Err.:	Std. Coeff.:	F to Remove
Intercept	.72			
GSF	-3.07E-7	2.55E-7	-.58	1.45
PECO	-1.18E-7	4.61E-7	.26	1.49
CO	1.87E-7	4.11E-7	.21	.21

Table 4.5 --continued

Stepwise Regression Y_1 :RCI2 5 X variables

Step No. 4 Variable Entered: X_4 : PercentF

R:	R-squared:	Adj. R-squared:	RMS Residual
.25	.06	.01	.24

Variables in Equation

Variable:	Coefficient:	Std. Err.:	Std. Coeff.:	F to Remove
Intercept	.67			
GSF	-3.37E-7	2.56E-7	-.64	1.73
PECO	6.23E-7	4.64E-7	.29	1.8
CO	2.28E-7	4.13E-7	.25	.31
PercentF	.37	.34	.13	1.18

(Last Step) Step No. 5 Variable Entered: X_5 : CURAGE

R:	R-squared:	Adj. R-squared:	RMS Residual
.36	.13	.07	.24

Variables in Equation

Variable:	Coefficient:	Std. Err.:	Std. Coeff.:	F to Remove
Intercept	.82			
GSF	-3.26E-7	2.48E-7	-.62	1.72
PECO	8.44E-7	4.59E-7	.4	3.38*
CO	7.38E-8	4.05E-7	.08	.03
PercentF	.37E-7	.33E-7	.12	1.23
CURAGE	- .01	3.29E-3	-.28	5.69*

* $p < .05$

It was found that 13% of the variance for the RCI2 was explained by the gross square footage, allocation of PECO funds, allocation of funds for capital outlay, the percent of the general fund spent for plant operation and maintenance and the current age of the building. When looking at the individual partial correlations only 2 of the five independent variables where found to make significant contributions to the regression equation. No significant contribution to the regression analysis was made by gross square footage, the allocation of funds for capital outlay, or the percent of general fund spent for plant operation and maintenance.

The relationship between allocation of PECO funds and the condition of the instructional facilities was found to be significant at the 0.05 level. The significant statistic $r = 0.4$ indicated a direct relationship between PECO fund allocations and the condition of the buildings with deferred maintenance. With a greater value of PECO fund allocation per community college a higher value for RCI2 was found. A larger RCI2 was indicative of better condition of the buildings. The RCI2 value was obtained by adding the estimated dollar amount for deferred maintenance into the computation of the replacement cost index. When using the RCI2, it was assumed that the buildings had been kept up and that no deferred maintenance existed. Even when buildings had been adequately cared for, this statistic indicated that PECO funds allocations explained a significant amount of the variance of the condition of the buildings.

The second significant relationship found was that between the current age of the building and the condition of instructional facilities with deferred maintenance. The significant statistic $r = -0.28$ indicated the inverse nature of the relationship. The older the building (greater number of years for current age) lower the value for the RCI2 (approaching zero) would be expected. In brief, the older the building the poorer the condition it would be expected to be in. This coefficient contributed an additional 7% explanation of the variance of the RCI2 in the regression analysis.

A total of six significant statistics were found in these analyses. Although some variables only explained small percentages of the variance they clearly established strength and direction of the relationships. On the basis on these findings Null Hypothesis I was rejected.

The second question addressed the differences between the conditions of community college instructional facilities and the size category of the college The null hypothesis used to test the second question was:

Ho2 - There are no significant differences between the conditions of community college instructional facilities as measured by the RCI when compared by size category of the college.

In order to test the second hypothesis an analysis of variance was used. The analysis of variance compared the means of the RCI for small, medium and large community colleges. The null hypothesis stated there were no differences between the means for each group. The summary for the analysis of variance is presented in Table 4-6.

The value for the F-test (.28) did not exceed the critical F-value, 3.13. On the basis of this finding Null Hypothesis Two failed to be rejected. There appeared to be no significant differences between the condition of community college instructional facilities as measured by the RCI when compared by size category of the college.

Table 4-6

Analysis of Variance (ANOVA) for Replacement Cost Index (RCI) and Size Category (small --1, medium --2, large --3)

One Factor ANOVA X_1 :SIZE Y_1 :RCI

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square	F-test:
Between groups	2	.03	.02	.28
Residual	75	4.02	.05	p = .7549
Total	77	4.05		

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Group 1	25	.55	.23	.05
Group 2	27	.52	.24	.05
Group 3	26	.57	.23	.04

The third question posed in this study addressed the differences between the conditions of community college instructional facilities with deferred maintenance and the size category of the college. The null hypothesis used to test the third question was:

Ho3 - There are no significant differences between the conditions of community college instructional facilities as measured by the RCI and reported levels of deferred maintenance when compared by the size category of the college.

In order to test the third hypothesis an analysis of variance was used. The analysis of variance compared the means of the RCI for small, medium and large community colleges. The null hypothesis stated there were no differences between the means for each group. The summary for the analysis of variance is presented in Table 4-7.

Table 4-7

Analysis of Variance (ANOVA) for Replacement Cost Index with Deferred Maintenance (RCI2) and Size Category (small --1, medium --2, large --3)

One Factor ANOVA X_1 :SIZE Y_1 :RCI2

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square	F-test:
Between groups	2	.04	.02	.34
Residual	75	4.58	.06	p = .7109
Total	77	4.63		

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Group 1	25	.7	.26	.05
Group 2	27	.64	.24	.05
Group 3	26	.68	.24	.05

The value for the F-test (.34) did not exceed the critical F-value, 3.13. On the basis of this finding Null Hypothesis Two failed to be rejected. There appear to be no significant differences between the conditions of community college instructional facilities with deferred maintenance as measured by the RCI2 when compared by the size category of the college.

Finally, the fourth question in this study addressed differences between the conditions of community college instructional facilities by adequacy and accessibility. The null hypothesis used to test the fourth question was:

Ho4 - There are no significant differences between the conditions of community college instructional facilities as measured by the RCI when compared by adequacy of the facility for current and future enrollment and accessibility to the facility in terms of complying with the federal Accessibility Guidelines for Buildings and Facilities; Proposed Rule ADA (1990).

In order to test the fourth hypothesis five analyses of variance (ANOVAs) were run for each condition of instructional facilities measure RCI and RCI2. The null hypothesis stated there were no differences between the means for each group. The means of the RCI and RCI2 were compared by responses to adequacy and accessibility. Question #5 in the building survey (see Appendix A) addressed the adequacy issue. Accessibility to the buildings for disabled individuals was evaluated in the building survey by question #6, (see Appendix A) which consisted of four parts. The results to the five ANOVAs for RCI are presented in tables 4-8 through 4-12. The results to the ANOVAs for RCI2 are presented in tables 4-13 through 4-17.

When comparing the conditions of instructional facilities statewide as measured by the RCI and adequacy (Q1) no significant statistic was found. The value for the F-test = .84 (Table 4-8) did not exceed the critical F-value, 3.98. There were no significant differences between the conditions of community college instructional facilities when compared by reported adequacy.

When the conditions of instructional facilities statewide as measured by the RCI were compared according to the first response to accessibility (Q2) no

Table 4-8

Analysis of Variance for Replacement Cost Index (RCI) and Response to Adequacy

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One Factor ANOVA X_1 :Q1 Y_1 :RCI

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square	F-test:
Between groups	1	.04	.04	.84
Residual	76	4	.05	p = .3616
Total	77	4.05		

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Group 1	28	.51	.19	.04
Group 2	50	.56	.25	.04

significant statistic was found. The value for the F-test = 0.82 (Table 4-9) did not exceed the critical F-value, 3.98. There were no significant differences between the conditions of community college instructional facilities when compared by reported accessibility as measured by question 6(a).

When comparing the conditions of instructional facilities statewide as measured by the RCI by the second response on accessibility (Q3) no significant statistic was found. The value for the F-test = 0.26 (Table 4-10) did not exceed the critical F-value, 3.98. There were no significant differences between the conditions of community college instructional facilities when compared by reported accessibility as measured by question 6(b).

Table 4-9

Analysis of Variance for Replacement Cost Index and Response to Accessibility (Question 6a)

One Factor ANOVA X_1 :Q2 Y_1 :RCI

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square	F-test:
Between groups	1	.03	.03	.82
Residual	76	4.02	.05	p = .4326
Total	77	4.05		

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Group 1	10	.6	.27	.09
Group 2	68	.54	.22	.03

Table 4-10

Analysis of Variance for Replacement Cost Index and Response to Accessibility (Question 6b)

One Factor ANOVA X_1 :Q3 Y_1 :RCI

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square	F-test:
Between groups	1	.01	.01	.26
Residual	76	4.03	.05	p = .615
Total	77	4.05		

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Group 1	6	.59	.32	.13
Group 2	72	.54	.22	.03

When the conditions of instructional facilities statewide as measured by the RCI were compared according to the third response to accessibility (Q4) no significant statistic was found. The value for the F-test = 0.01 (Table 4-11) did not exceed the critical F-value, 3.98. There were no significant differences between the conditions of community college instructional facilities when compared by reported accessibility as measured by question 6(c).

When comparing the conditions of instructional facilities statewide as measured by the RCI according to the fourth response to accessibility (Q5) no significant statistic was found. The value for the F-test = 0.01 (Table 4-12) did not exceed the critical F-value, 3.98. There were no significant differences between the conditions of community college instructional facilities when compared by reported accessibility as measured by question 6(d).

Table 4-11

Analysis of Variance for Replacement Cost Index and Response to Accessibility (Question 6c)

One Factor ANOVA X_1 :Q4 Y_1 :RCI

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square	F-test:
Between groups	1	2.68E-4	2.68E-4	.01
Residual	76	4.05	.05	p = .9436
Total	77	4.05		

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Group 1	22	.55	.27	.06
Group 2	56	.54	.21	.03

Table 4-12

Analysis of Variance for Replacement Cost Index and Response to Accessibility (Question 6d)

One Factor ANOVA X_1 :Q5 Y_1 :RCI

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square	F-test:
Between groups	1	2.68E-4	2.68E-4	.01
Residual	76	4.05	.05	p = .9436
Total	77	4.05		

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Group 1	22	.55	.27	.06
Group 2	56	.54	.21	.03

When comparing the conditions of instructional facilities statewide as measured by the Replacement Cost Index with Deferred Maintenance (RCI2) by adequacy (Q1) no significant statistic was found. The value for the F-test = 2.12 (Table 4-13) did not exceed the critical F-value, 3.98. There were no significant differences the between the conditions of community college instructional facilities when compared by reported adequacy.

When the conditions of instructional facilities statewide as measured by the RCI2 were compared according to the first response to accessibility (Q2) no significant statistic was found. The value for the F-test = 0.7 (Table 4-14) did not exceed the critical F-value, 3.98. There were no significant differences between

Table 4-13

Analysis of Variance for Replacement Cost Index with Deferred Maintenance and Response to Adequacy

One Factor ANOVA X_1 :Q1 Y_1 :RCI2

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square	F-test:
Between groups	1	.13	.13	2.12
Residual	76	4.5	.06	p = .1499
Total	77	4.63		

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Group 1	28	.72	.25	.05
Group 2	50	.64	.24	.03

the conditions of community college instructional facilities when compared by reported accessibility as measured by question 6(a).

When comparing the conditions of instructional facilities statewide as measured by the RCI2 according to the second response to accessibility (Q3) no significant statistic was found. The value for the F-test = 0.36 (Table 4-15) did not exceed the critical F-value, 3.98. There were no significant differences between the conditions of community college instructional facilities when compared by reported accessibility as measured by question 6(b).

When the conditions of instructional facilities statewide as measured by the RCI2 were compared according to the third response to accessibility (Q4) no significant statistic was found. The value for the F-test = 1.36E-3 (Table 4-16) did not exceed the critical F-value, 3.98. There were no significant differences between the conditions of community college instructional facilities when compared by reported accessibility as measured by question 6(c).

When comparing the conditions of instructional facilities statewide as measured by the RCI2 according to the fourth response to accessibility (Q5) no significant statistic was found. The value for the F-test = 1.36E-3 (Table 4-17) did not exceed the critical F-value, 3.98. There were no significant differences between the conditions of community college instructional facilities when compared by reported accessibility as measured by question 6(d).

Table 4-14

Analysis of Variance for Replacement Cost Index with Deferred Maintenance and Response to Accessibility (Question 6a)

One Factor ANOVA X_1 :Q2 Y_1 :RCI2

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square	F-test:
Between groups	1	.04	.04	.7
Residual	76	4.58	.06	p = .404
Total	77	4.63		

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Group 1	10	.73	.27	.09
Group 2	68	.66	.24	.03

Table 4-15

Analysis of Variance for Replacement Cost Index with Deferred Maintenance and Response to Accessibility (Question 6b)

One Factor ANOVA X_1 :Q3 Y_1 :RCI2

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square	F-test:
Between groups	1	.02	.02	.36
Residual	76	4.6	.06	p = .5499
Total	77	4.63		

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Group 1	6	.73	.31	.13
Group 2	72	.67	.24	.03

Table 4-16

Analysis of Variance for Replacement Cost Index with Deferred Maintenance and Response to Accessibility (Question 6c)

One Factor ANOVA X_1 :Q4 Y_1 :RCI2

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square	F-test:
Between groups	1	8.30E-5	8.30E-5	1.36E-3
Residual	76	4.63	.06	p = .9706
Total	77	4.63		

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Group 1	22	.67	.28	.06
Group 2	56	.67	.23	.03

Table 4-17

Analysis of Variance for Replacement Cost Index with Deferred Maintenance and Response to Accessibility (Question 6d)

One Factor ANOVA X_1 :Q5 Y_1 :RCI2

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square	F-test:
Between groups	1	8.30E-5	8.30E-5	1.36E-3
Residual	76	4.63	.06	p = .9706
Total	77	4.63		

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Group 1	22	.67	.28	.06
Group 2	56	.67	.23	.03

Based upon the findings described above Null Hypothesis Four failed to be rejected. Even though there were no significant differences between the means of the conditions of buildings measures when compared by reported adequacy and accessibility, the magnitude of reported non-adequacy and non-compliance was considerable.

Thirty six percent of the respondents stated that the buildings were not adequate for current enrollment. Twenty eight percent of the respondents stated that the buildings were not in compliance with at least one of the aspects of the Accessibility Guidelines for Buildings and Facilities; Proposed Rule (Federal Register, 1991).

CHAPTER V
SUMMARY, CONCLUSIONS, IMPLICATIONS, AND SUGGESTIONS FOR FURTHER RESEARCH

An overview of the study is presented in this chapter. The following sections are included: (a) summary, (b) conclusions, (c) implications, and (c) suggestions for further research.

Summary

Need for the Study

A review of literature indicated a growing national concern for the condition of college and university campus facilities. Two major problems associated with the deteriorating condition of educational facilities were capital renewal and deferred maintenance. Both of these problems have been related to the financial condition of the institutions.

Community colleges in most states derived the majority of their funds for capital outlay from state funds (Honeyman, Williamson, & Wattenbarger, 1991). The State of Florida was identified as one of those states. Members of Florida's Board of Education expressed major concerns for the condition of its educational facilities. Simultaneously, Florida had been experiencing a shortfall between anticipated resources needs and resources available for capital outlay.

The investigation was initiated by measuring the condition of community college instructional facilities throughout the state. Further insights were provided by determining what kind of relationships existed between the condition of the facilities, age of the facility, level of deferred maintenance, gross square footage of college, Florida's funding mechanisms, reported adequacy for enrollment and accessibility .

Statement of the Problem

The purpose of this study was to identify the condition of Florida's community college instructional facilities and to determine the relationship between the condition of those facilities and age of the facility, level of deferred maintenance, gross square footage of college, budget allocations for capital outlay, maintenance, and debt service. In addition, this study determined whether or not differences existed among the condition of those facilities, their levels of deferred maintenance according to the size of the institution.

As a result to the review of the literature the following questions were asked:

1. Are there significant relationships between the conditions of community college instructional facilities, as measured by the Replacement Cost Index (RCI) and age of the facility, level of deferred maintenance, gross square footage of college, and percentages of various budget categories (i.e. PECO, CO & DS, and Local) allocated for plant expenditures in Florida?
2. Are there significant differences between the conditions of community college instructional facilities as measured by the RCI when compared by size category of the college?

3. Are there significant differences between the conditions of community college instructional facilities as measured by the RCI and reported levels of deferred maintenance when compared by size category of the college?
4. Are there significant differences between the conditions of community college instructional facilities as measured by the RCI when compared by adequacy of the facility for current and future enrollment and accessibility to the facility in terms of complying with the Americans With Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Proposed Rule (Federal Register, 1991).

Four null Hypothesis were developed to test these questions. The results indicated the relationships and the differences which existed between the dependent variable--condition of community college instructional facilities (RCI & RCI2) and the independent variables--size category for college, gross square footage, current age of buildings, deferred maintenance, PECO allocations, CO allocations, percent of general fund spent on plant operations and maintenance, reported adequacy and accessibility.

Data Collection and Analyses

Data were obtained from the State Board of Education, Community College Division, Bureau of information systems and community college facility offices. Questionnaires were sent to the 28 community colleges in the state to collect information on 105 buildings. The responses included a total of 78 buildings located in 20 community colleges. The data collected enabled the construction of an inventory of descriptive nature of Florida's Community College instructional facilities. All data were then analyzed in the following sequence:

First, the current condition of Florida's community college instructional facilities was determined via the computation of the RCI. Two stepwise regression analyses were run to determine the nature and the extent of the relationship between the condition of community college facilities and age of the facility, level of deferred maintenance, gross square footage of college, and percentages of various categories allocated for plant expenditures in Florida. The first stepwise regression used the Replacement Cost Index (RCI) as the dependent variable while, the second, used the Replacement Cost Index with Deferred Maintenance (RCI2).

Next, the data were analyzed to determine if there were significant differences between the conditions of the community college instructional facilities according to the size of the institution. Two analyses of variance were run using RCI and RCI2.

Finally, survey data were used to compare the condition of instructional facilities measures RCI and RCI2 by responses to adequacy and accessibility. Five ANOVAs were run for each measure. Adequacy was assessed by one question in the building survey while accessibility was evaluated by four.

Conclusions

Condition of Community College Instructional Facilities and Age, Level of Deferred Maintenance, Gross Square Footage, and Budget Allocations

The findings of this study indicated that an inverse significant relationship existed between the condition of community college instructional facilities as measured by the Replacement Cost Index (RCI) and the current age of the building (r = -0.49). This significant statistic accounted for 23% of the variance. From this negative correlation it may be concluded that the better the condition of the building, the less the current number of years of age for a building. In other words, the older the building, the poorer the condition.

When the condition of community college instructional facilities as measured by the Replacement Cost Index (RCI) was correlated with deferred maintenance a significant statistic was found. The significant statistic (r = -0.15) accounted for an additional 3% of the variance in the regression equation. This statistic indicated an inverse relationship between the condition of the facilities and the estimated amount of deferred maintenance. The better the condition of the building, the less amount maintenance expenses were estimated as being deferred to date. The worse the condition of a building, a greater amount of maintenance expenses were estimated as being deferred to date.

A significant statistic was found when the condition instructional facilities as measured by the Replacement Cost Index (RCI) was correlated with PECO fund allocations. The significant statistic (r = 0.33) accounted for an additional 2% of the variance in the regression equation. This statistic indicated a direct relationship between the condition of the facilities and PECO fund allocations. The better the condition of the building, the greater the allocation PECO funds. The worse the condition of a building, the smaller the allocation of PECO funds.

When the condition of community college instructional facilities as measured by the Replacement Cost Index (RCI) was correlated with the percent of general fund spent on plant operation and maintenance a significant statistic (r = 0.22) was found. This statistic accounted for an additional 5% of the variance in the regression analysis. This statistic indicated a direct relationship between the condition of the facilities and the estimated amount of deferred maintenance. The better the condition of a facility, a greater percent of the general fund was spent on plant operation and maintenance. The worse the condition of a facility, a smaller percent of the general fund was spent on plant operation and maintenance.

The analysis was repeated using the Replacement Cost Index with Deferred Maintenance (RCI2) as the dependent variable. The findings remained consistent with what was reported before.

When the condition of community college instructional facilities as measured by the Replacement Cost Index with Deferred Maintenance (RCI2) was correlated with the current age of the building a significant statistic (r = -0.28) was found. This significant statistic indicates an inverse relationship between the condition of the facility and the current age of the building. The better the condition of a building, the lesser the current age in years of the building. The worse the condition of a facility, the greater number of years was found for current age.

A significant statistic (r = .40) indicated a direct relationship between the condition of instructional facilities with deferred maintenance and PECO fund allocations. The better the condition of the building, the greater the amount of

PECO funds allocation. The worse the condition of the building, the smaller the amount of PECO funds allocation.

Findings when testing hypothesis one. The findings of this study indicated that a significant amount (28%) of the variance of the condition of community college instructional facilities was explained by the current age of the facilities. The inverse relationship found between the condition of the buildings and their current age clearly indicated that the older buildings were the poorer the condition of the facility. By monitoring of the age of the buildings and incorporating a progressive age coefficient into maintenance allocations, both state and community college administrations could have a better control of the condition of the facilities.

Other variables found to explain a significant amount of the variance of the condition of the facilities were deferred maintenance and amount of PECO funds allocations. Deferred maintenance was found to have an inverse relationship with the condition of the facility. The lesser the amount of deferred maintenance the better the condition of the buildings. The greater the amount of deferred maintenance the worse the condition of the buildings. Deferred maintenance was found to be a major contributor to the condition of the facilities.

A positive relationship was found between PECO funds allocations and the condition of the facilities. The greater the allocation from PECO funds, a better condition of facilities was found. A major implication of this finding is that funding provided by the legislature had a significant effect on the condition of its community college instructional facilities.

The percent of the general fund spent on plant operation and maintenance had a direct relationship with the condition of the buildings. The greater the percent of general fund spent on plant operation and maintenance, the better the condition of the buildings. This fact should be kept in mind by community college administrators when making decisions regarding their expenditures.

Having determined that there are statistically significant relationships between the condition of community college instructional facilities and the percent of various budget categories allocated for plant expenditures in Florida, a question could be raised regarding the adequacy of such a mechanism. As mentioned before, the mean value for the RCI in Florida was 0.544. This value raises great concern when looking at the mean age of buildings in the state (18.59). The expected building life in Florida is 50 years (see sum of digits calculation on pg. 23). The condition of community college instructional facilities in Florida appears to be poor when taking into consideration the newness of its facilities.

Conditions of Community College Instructional Facilities in Florida

No statistically significant differences were found between the conditions of community college instructional facilities as measured by the Replacement Cost Index (RCI) when by the size category of the college. The RCI values for community college instructional facilities in Florida ranged from 0.22 to 1. This indicated the existence of buildings in need of extensive repair and alterations as well as adequately maintained buildings. The mean value for the RCI in Florida was 0.544. The mean RCIs for the different size categories were: small = 0.55, medium = 0.52, and large = 0.57. Even though a wide range of RCI values were computed for the state, there were no significant differences statewide.

Conditions of Community College Instructional Facilities with Deferred Maintenance

The findings of this study indicated that no statistically significant differences existed between the conditions of community college instructional facilities as measured by the Replacement Cost Index with Deferred Maintenance (RCI2) when compared according to the size category of the college. The RCI2 values for the buildings ranged from 0.27 to 1.33. The mean value for the RCI2 in Florida was 0.67. The mean RCIs for the different size categories were: small colleges = 0.7, medium = 0.62, and large = 0.68. While a wide range of RCI2 values were computed for the state, there were no significant differences statewide.

Findings when testing hypotheses two and three. No statistically significant differences were found when the conditions of the buildings, with or without deferred maintenance throughout the state were compared according to the size category of the college where the buildings were located. This may be explained by the fact that a significant amount of the variance of the RCI is explained by the current age of the buildings. The mean current age for the buildings in this study was 18.59. The mean current age of buildings for the different groups were: small colleges = 21.08, medium colleges = 17.56, and large colleges = 17.27. However, a more extensive study might determine if any differences exist within the size category.

Condition of Community College Instructional Facilities and Their Adequacy and Accessibility

The adequacy and accessibility variables were assessed by respondents perceptions of their buildings. When both Replacement Cost Index (RCI & RCI2) measures were compared according to responses to adequacy and accessibility, no significant differences were found. However, 36% of the respondents stated that the buildings were not adequate for current enrollment while 28% of the respondents stated that the buildings were not in compliance with at least one of the aspects of the Accessibility Guidelines for Buildings and Facilities; Proposed Rule (Federal Register, 1991). Any attempt to improve this situation may result in a major expense to either community college or state administration.

Findings when testing hypothesis four. Even though no significant differences were found when comparing the conditions of community college instructional facilities statewide by responses to adequacy and accessibility, the percentages of responses stating non adequate and non complying facilities were significant. This indicates the need for community colleges to perform thorough evaluations of their facilities.

Implications

This was the first comprehensive study evaluating the condition of community college instructional facilities in Florida. It may be used as a starting point for future studies addressing issues of deferred maintenance, age of the facilities, funding mechanism, adequacy and accessibility. A strong relationship was found between age and the condition of community college instructional facilities. The mean condition of community college instructional facilities for the state as measured by the RCI was 0.54. When deferred maintenance was taken into consideration, the mean value for the RCI2 was 0.67. These values are very low since that the mean age for the facilities was only 18.59 years. The state of Florida has assumed a 50-year building life when funding for renovation, remodeling, and maintenance. However, at the rate that facilities were deteriorating it would seem unlikely that the facilities would last 50 years. The results of this study clearly indicated the need to monitor the effect of age and deferred maintenance on the condition of educational facilities. The results of this study could be explained by the use of an inadequate funding mechanism.

Suggestions for Further Research

Further study is recommended for evaluation of the criteria for allocation of funds throughout the state as well as management of funds within the individual community colleges. Comparative studies for states with different funding mechanisms would aid in the development of these criteria.

More extensive and detailed study is recommended to determine whether there are any differences between the conditions of community college instructional facilities when comparing according to the size of the community college where the building is located.

During the data collection stage of this investigation, confusion and uncertainty was expressed by respondents regarding understanding of the Accessibility Guidelines for Buildings and Facilities; Proposed Rule (Federal

Register, 1991). Self-studies for individual community colleges that assess both the condition of their facilities as well as compliance with the Accessibility Guidelines for Buildings and Facilities; Proposed Rule (Federal Register, 1991) are recommended.

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APPENDIX A
BUILDING SURVEY

(Building Name)
BUILDING SURVEY
FALL 1991

1) Name of Building: (Building Name)

2) Person Completing Form:______________________________________

3) Cost of Original Construction: $______________

4) Approximate Cost of all Major improvements, renovations, and/or maintenance expenses made on this Building (since it was built): $________________

5) Is this building adequate[1] for current enrollment:

YES NO

6) Please evaluate accessibility[2] to building in terms of the following:

   a) Does this building have disabled accessible entrances:

   YES NO

   b) Does this building have adequate routes to disabled accessible entrances:
   YES NO

   c) Does this building have men's disabled accessible restroom(s) for:

   YES NO

   d) Does this building have women's disabled accessible restroom(s):

   YES NO

7) Estimate the value of needed repairs and renovations which have been deferred to date:
$________________

8) Estimate the current replacement cost for this building. $________________

---

[1] Adequacy refers to the capacity of the building for the current and projected student enrollments.

[2] Accessibility will be evaluated in terms of meeting the Americans With Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Proposed Rule. The term is defined as describing a site, building, facility or portion thereof that complies with the guidelines and that can be approached, entered, and used by individuals with disabilities including those affecting mobility, sensory or cognitive functions.

APPENDIX B
COVER LETTER

Institute of Higher Education
229 Norman Hall
(904) 392-0745

October 30, 1991

To Whom It May Concern:

The Inter-Institutional Research Council is sponsoring a study at the University of Florida, the purpose of which is to identify the condition of Florida's community college instructional facilities and to determine the relationship between the condition of those facilities and budget allocations for capital outlay, maintenance and debt service.

While most of the relevant financial data have already been collected, in order to complete this study we need information on a few buildings on your college campus(es). You will find enclosed several survey forms, one for each selected building in your college. These buildings have been randomly selected from the Division of Community Colleges Facilities Inventory. Your assistance in providing the information requested will be greatly appreciated. Please answer each item to the best of your knowledge, estimating when necessary. If I can be helpful in this process please call me at (904) 392-0745 (suncom 622-0745).

The results to this study will be very useful to the future financing of community college facilities in Florida. We will, of course, provide your college with a copy of the results of the study.

Thank you for your assistance.

CML/cl

Enclosure

Carolina M. Lopez
Graduate Research Assistant

APPENDIX C
DESCRIPTIVE STATISTICS FOR ALL VARIABLES IN SAMPLE

X_1 : SIZE

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
2.01	.81	.09	.66	40.43	78
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
1	3	2	157	367	0

X_2 : BLDGDATE

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
1973.41	8.62	.98	74.37	.44	78
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
1954	1992	38	153926	303764874	0

X_3 : CURAGE

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
18.59	8.62	.98	74.37	46.39	78
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
0	38	38	1450	32682	0

X_4 : CostOC

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
1138787.31	1254048.7	141993.05	1.57E12	110.12	78
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
75000	5887516.49	5812516.49	88825409.84	2.22E14	0

X_5 : CostIC

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
219791.02	403228.82	45656.67	1.63E11	183.46	78
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
0	3133357	3133357	17143699.22	1.63E13	0

X_6 : OCIC

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
1358578.32	1326236.04	150166.66	1.76E12	97.62	78
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
80000	6423877.99	6343877.99	1.06E8	2.79E14	0

X_7 : CurrRep

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
2535692.18	2047753.48	231862.42	4.19E12	80.76	78
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
95000	8000000	7905000	197783990	8.24E14	0

X_8 : RCI

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.54	.23	.03	.05	42.17	78
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
.22	1	.78	42.41	27.11	0

X_9 : DEFMAIN

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
239269.53	337526.61	38217.36	1.14E11	141.07	78
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
0	1971264	1971264	18663023	1.32E13	0

X_{10} : Q1

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.64	.48	.05	.23	75.32	78
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
0	1	1	50	50	0

X_{11} : Q2

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.87	.34	.04	.11	38.6	78
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
0	1	1	68	68	0

X_{12} : Q3

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.92	.27	.03	.07	29.05	78
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
0	1	1	72	72	0

X_{13} : Q4

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.72	.45	.05	.21	63.08	78
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
0	1	1	56	56	0

X_{14} : Q5

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.72	.45	.05	.21	63.08	78
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
0	1	1	56	56	0

X_{15} : GSF

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
699601.77	466082.96	52773.5	2.17E11	66.62	78
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
139400	1796600	1657200	54568938	5.49E13	0

X_{16} : PECO

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
179274	115127	13035.57	1.33E10	64.22	78

Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
40616	452881	412265	13983372	3.53E12	0

X_{17} : CO

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
366010.05	270618.9	30641.56	7.32E10	73.94	78

Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
50760	987940	937180	28548784	1.61E13	0

X_{18} : MAINT$

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
3317338.46	2840144.57	321583.05	8.07E12	85.62	78

Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
532093	16515849	15983756	258752400	1.48E15	0

X_{19} : genfund

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
28816130.41	19780414.22	2239690.87	3.91E14	68.64	78

Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
5303023	66153187	60850164	2247658172	9.49E16	0

X_{20} : PercentF

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.12	.08	.01	.01	68.3	78

Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
.08	.61	.53	9.42	1.66	0

```
                              X21  : OCIC+DEFMAINT
Mean:        Std. Dev.:    Std. Error:   Variance:    Coef. Var.:   Count:
1597847.85   1368143.25    154911.72     1.87E12      85.62         78
Minimum:     Maximum:      Range:        Sum:         Sum of Sqr.:  # Missing:
95000        6673877.99    6578877.99    1.25E8       3.43E14       0
```

```
                              X22 : RCI2
Mean:        Std. Dev.:    Std. Error:   Variance:    Coef. Var.:   Count:
.67          .25           .03           .06          36.57         78
Minimum:     Maximum:      Range:        Sum:         Sum of Sqr.:  # Missing:
.27          1.33          1.06          52.28        39.67         0
```

```
                              X23  : PECO/SQFT
Mean:        Std. Dev.:    Std. Error:   Variance:    Coef. Var.:   Count:
.27          .06           .01           4.08E-3      23.52         78
Minimum:     Maximum:      Range:        Sum:         Sum of Sqr.:  # Missing:
.16          .4            .24           21.18        6.07          0
```

Descriptive statistics for all variables in sample group = SMALL

X_1 : SIZE

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
1	0	0	0	0	25
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
1	1	0	25	25	0

X_2 : BLDGDATE

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
1970.92	9.06	1.81	82.16	.46	25
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
1954	1990	36	49273	97115113	0

X_3 : CURAGE

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
21.08	9.06	1.81	82.16	43	25
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
2	38	36	527	13081	0

X_4 : CostOC

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
627480.11	975429.98	195086	9.51E11	155.45	25
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
75000	3900000	3825000	15687002.76	3.27E13	0

X_5 : CostIC

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
183352.42	260852.57	52170.51	6.80E10	142.27	25
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
1000	1100000	1099000	4583810.45	2.47E12	0

X_6 : OCIC

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
810832.53	1052709.05	210541.81	1.11E12	129.83	25
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
80000	4150000	4070000	20270813.21	4.30E13	0

X_7 : CurrRep

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
1441514.6	1616135.29	323227.06	2.61E12	112.11	25
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
95000	6950000	6855000	36037865	1.15E14	0

X_8 : RCI

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.55	.23	.05	.05	41.95	25
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
.22	1	.78	13.72	8.8	0

X_9 : DEFMAIN

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
151991.24	184843.84	36968.77	3.42E10	121.61	25
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
0	755000	755000	3799781	1.40E12	0

X_{10} : Q1

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.72	.46	.09	.21	63.65	25
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
0	1	1	18	18	0

X_{11} : Q2

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.8	.41	.08	.17	51.03	25

Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
0	1	1	20	20	0

X_{12} : Q3

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.92	.28	.06	.08	30.1	25

Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
0	1	1	23	23	0

X_{13} : Q4

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.64	.49	.1	.24	76.55	25

Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
0	1	1	16	16	0

X_{14} : Q5

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.64	.49	.1	.24	76.55	25

Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
0	1	1	16	16	0

X_{15} : GSF

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
243061.52	57644.66	11528.93	3.32E9	23.72	25

Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
139400	298839	159439	6076538	1.56E12	0

X_{16} : PECO

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
76705.2	19150.75	3830.15	3.67E8	24.97	25
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
40616	94955	54339	1917630	1.56E11	0

X_{17} : CO

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
92496	31481.52	6296.3	991086248	34.04	25
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
50760	130716	79956	2312400	2.38E11	0

X_{18} : MAINT$

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
966913.68	393270	78654	1.55E11	40.67	25
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
532093	1517072	984979	24172842	2.71E13	0

X_{19} : genfund

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
8430938.24	2457721.34	491544.27	6.04E12	29.15	25
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
5303023	11707184	6404161	210773456	1.92E15	0

X_{20} : PercentF

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.11	.02	3.56E-3	3.17E-4	15.86	25
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
.09	.13	.04	2.81	.32	0

X_{21} : OCIC+DEFMAINT

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
962823.77	1110531.41	222106.28	1.23E12	115.34	25
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
95000	4500000	4405000	24070594.21	5.28E13	0

X_{22} : RCI2

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.7	.26	.05	.07	37.44	25
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
.3	1.33	1.03	17.39	13.72	0

X_{23} : PECO/SQFT

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.31	.02	3.13E-3	2.45E-4	4.97	25
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
.29	.34	.05	7.86	2.48	0

Range Restrictions

	Column Name:	Restriction:
AND	SIZE	1 ≤ X ≤ 1
AND	SIZE	1 ≤ X ≤ 1

Descriptive statistics for all variables in sample group = MEDIUM

X_1 : SIZE

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
2	0	0	0	0	27
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
2	2	0	54	108	0

X_2 : BLDGDATE

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
1974.44	7.57	1.46	57.26	.38	27
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
1959	1990	31	53310	105259122	0

X_3 : CURAGE

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
17.56	7.57	1.46	57.26	43.1	27
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
2	33	31	474	9810	0

X_4 : CostOC

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
1129184.89	1033020.32	198804.85	1.07E12	91.48	27
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
89000	5098725	5009725	30487992	6.22E13	0

X_5 : CostIC

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
316502.44	605493.31	116527.24	3.67E11	191.31	27
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
5000	3133357	3128357	8545566	1.22E13	0

X_6 : OCIC

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
1445687.33	1162307.92	223686.26	1.35E12	80.4	27
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
112000	5234525	5122525	39033558	9.16E13	0

X_7 : CurrRep

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
3023405.89	2094938.65	403171.13	4.39E12	69.29	27
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
409267	7448408	7039141	81631959	3.61E14	0

X_8 : RCI

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.52	.24	.05	.06	45.92	27
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
.23	.99	.76	13.99	8.73	0

X_9 : DEFMAIN

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
290739.41	432471.83	83229.24	1.87E11	148.75	27
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
0	1971264	1971264	7849964	7.15E12	0

X_{10} : Q1

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.56	.51	.1	.26	91.15	27
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
0	1	1	15	15	0

X_{11} : Q2

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.85	.36	.07	.13	42.5	27
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
0	1	1	23	23	0

X_{12} : Q3

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.85	.36	.07	.13	42.5	27
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
0	1	1	23	23	0

X_{13} : Q4

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.67	.48	.09	.23	72.06	27
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
0	1	1	18	18	0

X_{14} : Q5

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.67	.48	.09	.23	72.06	27
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
0	1	1	18	18	0

X_{15} : GSF

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
673151.85	310603.06	59775.59	9.65E10	46.14	27
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
323160	1263900	940740	18175100	1.47E13	0

```
                                X16 : PECO
Mean:          Std. Dev.:     Std. Error:    Variance:     Coef. Var.:   Count:
157200.37      79452.58       15290.66       6.31E9        50.54         27
Minimum:       Maximum:       Range:         Sum:          Sum of Sqr.:  # Missing:
75930          288113         212183         4244410       8.31E11       0
```

```
                                X17 : CO
Mean:          Std. Dev.:     Std. Error:    Variance:     Coef. Var.:   Count:
328653.04      119278.33      22955.13       1.42E10       36.29         27
Minimum:       Maximum:       Range:         Sum:          Sum of Sqr.:  # Missing:
177660         507600         329940         8873632       3.29E12       0
```

```
                                X18 : MAINT$
Mean:          Std. Dev.:     Std. Error:    Variance:     Coef. Var.:   Count:
3878775.26     3858012.79     742474.91      1.49E13       99.46         27
Minimum:       Maximum:       Range:         Sum:          Sum of Sqr.:  # Missing:
1368528        16515849       15147321       104726932     7.93E14       0
```

```
                                X19 : genfund
Mean:          Std. Dev.:     Std. Error:    Variance:     Coef. Var.:   Count:
25577736.07    9731330.84     1872795.49     9.47E13       38.05         27
Minimum:       Maximum:       Range:         Sum:          Sum of Sqr.:  # Missing:
12699835       37820818       25120983       690598874     2.01E16       0
```

```
                                X20 : PercentF
Mean:          Std. Dev.:     Std. Error:    Variance:     Coef. Var.:   Count:
.15            .14            .03            .02           90.37         27
Minimum:       Maximum:       Range:         Sum:          Sum of Sqr.:  # Missing:
.09            .61            .52            4.03          1.08          0
```

X_{21} : OCIC+DEFMAINT

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
1736426.74	1194797.74	229938.93	1.43E12	68.81	27
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
125600	5414725	5289125	46883522	1.19E14	0

X_{22} : RCI2

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.64	.24	.05	.06	37.87	27
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
.27	1.1	.83	17.28	12.59	0

X_{23} : PECO/SQFT

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.23	.04	.01	1.41E-3	16.1	27
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
.18	.29	.11	6.29	1.5	0

Range Restrictions

	Column Name:	Restriction:
AND	SIZE	$2 \leq X \leq 2$

Descriptive statistics for all variables in sample group = LARGE

X_1 : SIZE

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
3	0	0	0	0	26
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
3	3	0	78	234	0

X_2 : BLDGDATE

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
1974.73	9.03	1.77	81.48	.46	26
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
1957	1992	35	51343	101390639	0

X_3 : CURAGE

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
17.27	9.03	1.77	81.48	52.27	26
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
0	35	35	449	9791	0

X_4 : CostOC

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
1640400.58	1515681.04	297249.51	2.30E12	92.4	26
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
88128	5887516.49	5799388.49	42650415.08	1.27E14	0

X_5 : CostIC

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
154397.03	195709.07	38381.71	3.83E10	126.76	26
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
0	850000	850000	4014322.77	1.58E12	0

X_6 : OCIC

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
1794797.61	1562828.37	306495.86	2.44E12	87.08	26
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
108128	6423877.99	6315749.99	46664737.85	1.45E14	0

X_7 : CurrRep

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
3081314.08	2019871.41	396129.37	4.08E12	65.55	26
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
171336	8000000	7828664	80114166	3.49E14	0

X_8 : RCI

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.57	.23	.04	.05	39.92	26
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
.23	1	.77	14.7	9.59	0

X_9 : DEFMAIN

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
269741.46	334856.08	65670.68	1.12E11	124.14	26
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
0	1200000	1200000	7013278	4.69E12	0

X_{10} : QI

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.65	.49	.1	.24	74.2	26
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
0	1	1	17	17	0

X_{11} : Q2

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.96	.2	.04	.04	20.4	26
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
0	1	1	25	25	0

X_{12} : Q3

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
1	0	0	0	0	26
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
1	1	0	26	26	0

X_{13} : Q4

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.85	.37	.07	.14	43.48	26
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
0	1	1	22	22	0

X_{14} : Q5

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.85	.37	.07	.14	43.48	26
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
0	1	1	22	22	0

X_{15} : GSF

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
1166050	360685.39	70736.23	1.30E11	30.93	26
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
888450	1796600	908150	30317300	3.86E13	0

X_{16} : PECO

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
300820.46	86571.62	16978.09	7.49E9	28.78	26
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
150484	452881	302397	7821332	2.54E12	0

X_{17} : CO

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
667798.15	196922.43	38619.67	3.88E10	29.49	26
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
483160	987940	504780	17362752	1.26E13	0

X_{18} : MAINT$

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
4994331.77	653257.7	128114.37	4.27E11	13.08	26
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
4157632	5963535	1805903	129852626	6.59E14	0

X_{19} : genfund

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
51780224.69	11201971.6	2196887.38	1.25E14	21.63	26
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
37553995	66153187	28599192	1346285842	7.28E16	0

X_{20} : PercentF

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
1	.02	3.06E-3	2.44E-4	15.76	26
Minimum:	Maximum:	Range:	Sum:	Sum of Sqr.:	# Missing:
.08	.12	.04	2.58	.26	0

```
                         X21  : OCIC+DEFMAINT
Mean:         Std. Dev.:    Std. Error:   Variance:     Coef. Var.:   Count:
2064539.07    1563998.79    306725.4      2.45E12       75.76         26
Minimum:      Maximum:      Range:        Sum:          Sum of Sqr.:  # Missing:
123128        6673877.99    6550749.99    53678015.85   1.72E14       0
```

```
                              X22 : RCI2
Mean:         Std. Dev.:    Std. Error:   Variance:     Coef. Var.:   Count:
.68           .24           .05           .06           35.29         26
Minimum:      Maximum:      Range:        Sum:          Sum of Sqr.:  # Missing:
.31           1.21          .9            17.61         13.36         0
```

```
                         X23  : PECO/SQFT
Mean:         Std. Dev.:    Std. Error:   Variance:     Coef. Var.:   Count:
.27           .09           .02           .01           31.89         26
Minimum:      Maximum:      Range:        Sum:          Sum of Sqr.:  # Missing:
.16           .4            .24           7.03          2.08          0
```

```
                              Range Restrictions

         Column Name:                      Restriction:
AND      SIZE                              3 ≤ X ≤ 3
```

BIOGRAPHICAL SKETCH

Carolina Maria Lopez, a native of Santo Domingo, Dominican Republic, received the degree of Architect from the Universidad Nacional Pedro Henriquez Urena in Santo Domingo on November, 1982. After receiving this degree, she worked for the engineering and construction firm Haza y Pellerano & Company in Santo Domingo, Dominican Republic, as head of the design division for six months. She was later in charge of the design and construction of the remodeling proposal for the interiors of the Museum of the Royal Houses, located within the historic district of Santo Domingo.

In the summer of 1983 she participated in the program offered by the Preservation Institute: Nantucket, Massachusetts. Upon its completion Carolina enrolled in the University of Florida to pursue a Master of Architecture degree in preservation. She received her degree in December, 1984.

In the spring of 1985, Carolina enrolled in the University of Florida to pursue the degree of Doctor of Education in the area of educational leadership. During the course of her studies she worked as a graduate research assistant in the Food Science and Human Nutrition Department. The last two years of her program she was employed by the Community Development Department in the City of Gainesville in the capacity of Planning Assistant. She received her degree in December 1992.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

David S. Honeyman, Chair
Associate Professor of Educational
Leadership

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

James L Wattenbarger

James L. Wattenbarger, Cochair
Distinguished Service Professor of
Educational Leadership

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

George Scheffer
Professor of Architecture

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

Rachel B Shireman

Rachel B. Shireman
Professor of Food Science and Human
Nutrition

This dissertation was submitted to the Graduate Faculty of the College of Education and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Education.

December, 1992

David C Smith

Dean, College of Education

Dean, Graduate School